

COMPUTERWORLD

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Industry Spotlight

Users Tracking DBMS Features

By Marcia Blumenthal
CW Staff

No longer impressed with the technology of data base management systems, today's leading-edge users of those systems are hot on the trail of new product features.

The marketplace for DBMS is becoming very sophisticated, Ronald G. Ross, editor of the "Data Base Newsletter," observed. DBMS is not a stand-alone system anymore, but one that is integrated with several components, all of which have been sold as separate products.

Eleven vendors of IBM-compatible DBMS interviewed by *Computerworld* recently claimed that, in general, their products were either fully integrated or in the process of achieving full integration with components considered necessary for the current generation of DBMS. These components, which should operate in an interactive environment, are telepro-

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Head-to-Head With IBM

DEC Joins Personal Computer Fray

By Marcia Blumenthal

CW Staff

BOSTON — Digital Equipment Corp.'s long-awaited series of personal computers premiered last



CW Photo by M. Blumenthal

Introducing Digital Equipment Corp.'s new series of personal computers, company President Kenneth Olsen quipped, "You can use it anywhere, even in a hammock."

week, announced via a satellite transmission beamed to Boston, Toronto and London locations.

The quartet of personal computer products includes the entry-level Rainbow 100, the Decmate II and two Professional series units, the Model 325 and the Model 350.

At the entry level, the Rainbow 100 features a dual-microprocessor design, one a Zilog, Inc. Z80 and the other an Intel Corp. 8088. The Decmate II, said to be a replacement for the current Decmate, is geared toward production word processing and specific business applications (story on Page 4).

On the high end, the Professional 325 and 350 were designed to be used as either stand-alone systems or distributed workstations in medium and large-size companies. The 300 series uses the same PDP-11 CPU chip that is the core of the 16-bit PDP-11/23 system.

Analysts were generally impressed with all the systems, finding them extremely competitive with the IBM Personal Computer in both functionality and price. For example, IBM's system offers only 320K bytes of diskette storage, compared with 800K bytes for each of DEC's personal

(Continued on Page 4)

DG Expands 16-Bit CS Line With Four Business Models

By Tim Scannell

CW Staff

WESTBORO, Mass. — Data General Corp. expanded its 16-bit Commercial Systems (CS) family today by introducing four business computer systems that are priced lower and are said to offer up to three times more

performance than its previous systems line.

The four new systems are the CS/5, CS Series 100 and two models of the CS Series 200. Two of the new systems incorporate the firm's Micro-eclipse processor, which debuted earlier this year with two of the firm's Technical Systems products [CW, March 22]. A third incorporates a full Eclipse processor. All are being introduced exactly five years after the CS line was launched and replace the firm's CS/10, CS/50 and CS/70 systems.

At the same time, DG's Small Business Systems Division also introduced a 5M-byte Winchester disk drive that is included with some packaged CS machines and three interactive office-oriented software packages, one of which reportedly represents the first time DG has integrated word and data processing in its CS line of computers.

(Continued on Page 8)

Social Security Drafted in Hunt for Evaders

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The Selective Service System will soon begin searching computerized Social Security files for names of American men who have failed to register for the draft. The exercise is the first step in a wide federal agency computer matching project to identify the over

500,000 people who have not registered.

The matching project, which the Selective Service indicated will begin later this month, culminates years of controversy, debate and legal wrangling over the privacy implications of using existing computer files to enforce the two-year-old draft law.

According to Selective Service spokeswoman Joan Lamb, approximately 93% of all draft-age American males have signed up since registration resumed in 1980. With the draft rolls nearing eight million men, that leaves some 525,000 still unaccounted for, she noted.

To identify those unregistered men, Congress recently gave the service explicit authority to search Social Security files. The Selective Service believes those files contain the names

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DP Exec Has Companywide Clout, Dotted-Line Responsibility at GTE

By Bruce Hoard

CW Staff

STAMFORD, Conn. — Bob McElroy would like to have the time to train for a marathon and read a few more books, but he'll settle for "dotted-line" responsibility over 4,000 people and a budget of nearly \$1 billion.



CW Photo by B. Hoard

Bob McElroy

ted-line" responsibility over 4,000 people and a budget of nearly \$1 billion.

When he says dotted-line responsibility, McElroy, the recently promoted vice-president for information management services at GTE, means he communicates with the company's top people in a variety of high-technology areas. These include data processing, office systems and information access, telecommunications, planning and evaluation and information management human resources planning.

Beyond the indirect influence he wields over products and services offered to the outside world, the 50-year-old native of Oyster Bay, N.Y., has direct hands-on power over the

(Continued on Page 8)

Nasdaq Net Tied to Seven Exchanges

By Bruce Hoard

CW Staff

NEW YORK — Starting today, the National Association of Securities Dealers Automatic Quotation (Nasdaq) data communications network will be directly connected to the Intermarket Trading System network used by the seven major U.S. stock exchanges.

Linking the Nasdaq and Intermarket Trading System networks will expedite trading and reduce stock prices, according to analysts. The link will allow traders in brokerage houses nationwide to trade initially 30 stocks directly with

market makers in any of the seven exchanges.

The National Association of Securities Dealers (Nasdaq) is a self-regulatory organization that oversees the over-the-counter market. The seven major exchanges are the New York and American Stock Exchanges in New York, the Philadelphia Stock Exchange, the Boston Stock Exchange, the Cincinnati Stock Exchange, the Midwest Stock Exchange in Chicago and the Pacific Stock Exchange, split between Los Angeles and San Francisco.

The Intermarket Trading System (Continued on Page 6)



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On Proposed BPSS

FCC Wants More Facts From Bell

WASHINGTON, D.C. — The Federal Communications Commission (FCC) has asked AT&T for more information about its Bell Packet-Switching Service (BPSS), the phone company's proposed backbone network for various value-added communications services it plans to offer in coming years. The first of these new offerings will be Advanced Communications Services (ACS).

The FCC request came after prospective competitors of ACS had criticized key details of the proposed BPSS tariff. One allegation is that the service is not "basic" as that term is defined in the Commission's Second Computer Inquiry Decision.

As a result, critics maintain that AT&T will be able to cross-subsidize the costs of BPSS, ACS and other services implemented on the new network, with revenues earned from its regulated long-distance business.

Among the commission's 20 questions were a number that addressed this point. For example, while AT&T has said that BPSS will interface at a customer location where packets are fully formed, "most end-user terminals are not packetized, [so] this would suggest that packetization would have to occur in the BPSS equipment. Please explain this apparent conflict."

Related Front

Meanwhile, on a related front, AT&T said its new "fully-separated subsidiary," currently known as XYZ, Inc., will not initially obtain services from other parts of the Bell organization.

This has been the subject of another protracted battle between the phone company and its competitors. They

claim that by allowing more than a minimal amount of sharing, the FCC will provide a means by which the regulated side of AT&T can surreptitiously cross-subsidize the unregulated side.

AT&T has submitted a voluminous description of how it plans to regulate the financial and other interactions between the fully separated subsidiary and the rest of the company.

But the commission has not yet re-

viewed this material. Fearing that this review will delay the scheduled June 1 startup date of the subsidiary, the phone company said it would delay all sharing activities until next Jan. 1. But the company added that "those who have... argued that only the most limited sharing be permitted have failed to reconcile their view with the commission's orders, which expressly imposed only the minimum separation requirements in areas where Computer II rules will not be otherwise in jeopardy."

DP Prof. Escapes Mail Bomb

By Brad Schultz

CW New York Bureau

NASHVILLE, Tenn. — A package mailed to Prof. Patrick Fischer, the head of Vanderbilt University's computer science department, exploded in his office recently, injuring his secretary while Fischer was in Puerto Rico.

The U.S. Postal Service was searching for a suspect and a motive in the bombing at press time last week.

The explosion drove splinters of wood into Fischer's secretary, Janet Smith, who is reportedly recovering satisfactorily after three days of hospitalization, and caused minor physical damage to the professor's office here.

Return Address

About the size and shape of a cigar box, the package was initially mailed to Fischer at Pennsylvania State University and bore the return address of an individual at Brigham Young University's Engineering Department in Provo, Utah.

Fischer left the faculty of Pennsylvania State to join Vanderbilt about 2½ years ago. The computer scientist said whoever sent the bomb apparently lacked up-to-date information on his whereabouts and activities.

According to Fischer, the package was forwarded from Pennsylvania State to Vanderbilt and exploded on May 5 when, in the course of opening the day's mail, Smith set off a detonator as she broke an inner wrapping of the package.

Fischer returned from a lecturing engagement at the University of Puerto Rico in San Juan on May 7.

Investigators do not regard the individual identified in the package's return address as a likely suspect, according to Fischer. That person's name is being withheld as the investigation continues.

Fischer said he had received no written or verbal threats prior to the incident and that he had no suspect in mind. The computer scientist said he would be especially careful about opening mail in the future.

This Week

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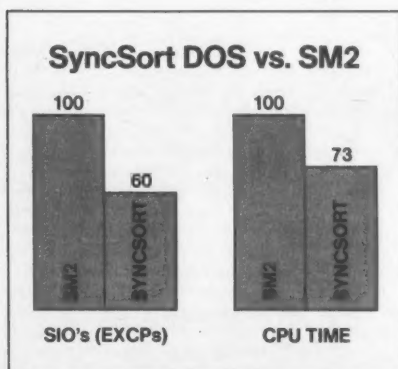
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* * * *

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DEC Unveils Rainbow 100, Decmate II Systems

By Marcia Blumenthal
CW Staff

BOSTON — As part of its series of personal computer introductions (see story on Page 1), Digital Equipment Corp. unveiled its entry-level Rainbow 100 personal computer and new Decmate II system.

Rainbow 100 is a dual processor unit, incorporating Zilog, Inc. Z80 and Intel Corp. 8088 microprocessors, which are capable of running both 8-bit and 16-bit applications software, respectively.

The operating software for Rainbow 100 is CP/M 86/80, a hybrid version of CP/M-80 and CP/M-86 and MS-DOS, the operating system used for the IBM Personal Computer.

A special feature of the operating system is a facility that automatically determines whether an applications program is in 16-bit or 8-bit word-length form and calls the appropriate processor to run the program, according to the vendor.

The system is designed for use as a stand-alone or as a "locally intelligent" satellite to a larger computer system. Rainbow 100 can be connected to electronic mail systems for transmitting and receiving documents.

Two Packages

Two special Rainbow 100 software packages enable the system to perform character exchange (CX) com-

munications and document exchange (DX) file transfer operations. The CX facility allows users to transmit text from a CP/M disk file to a host computer or to direct incoming text from a host to either a printer or a disk file in CP/M format. The CX facility will work with any host, including many publicly available data services, DEC said.

The DX facility allows users to transfer documents between Rainbow 100 and other systems, including Decmate, DEC's PDP-11 office systems running under RSTS/E and the DEC VAX-11 supermini.

DEC will sell and support several applications packages for Rainbow. Among them are Microsoft Corp.'s Multiplan Spread-Sheet Calculator and Mbasic compiler and Mark Williams Co.'s C compiler, a spokesman said.

Rainbow Configuration

Rainbow 100 comes with a free-standing mobile CRT, a low-profile keyboard, dual 5¼-in. floppy disk storage units that offer a total of 800K bytes of storage, 64K bytes of random-access memory and self-test diagnostics and is priced at \$3,245. The CP/M 86/80 operating system costs an additional \$250. A main-memory upgrade to 256K bytes is available as well as a color video monitor and a 5M-byte external Winchester disk unit. It will be available

DEC Signs Software Suppliers

BOSTON — In conjunction with its personal computer announcements (see related story), Digital Equipment Corp. revealed a variety of arrangements with software suppliers, including a Digital Software Classified program under which DEC tests and certifies the usability of selected software for its just-introduced personal computer systems.

DEC will sell the systems directly to high-volume end users — 100 to 200 systems per year — with smaller volumes being sold through DEC stores. The company has already signed distributor ar-

rangements with Computerland retail stores and Hamilton/Avnet, Inc., according to a company spokesman.

Through DEC's special software-producer program, many systems software and applications are being made available by independent software developers, including Visicorp, Inc.'s Visicalc and Softech Microsystems, Inc.'s UCSD p-System, the spokesman said. To date, DEC has software-producer relationships with 22 software companies for more than 75 applications for the Professional series.

during the fourth quarter, DEC said.

Decmate II, a replacement for the Decmate processor, is built around a custom-designed 6120 microprocessor and has a main-memory capacity of 96K bytes. The system is targeted for use in both word and business applications processing.

Decmate II also has the CX and DX communications options, DEC said.

Priced from \$3,740, Decmate II includes the processor, keyboard, CRT, dual floppy disk drives with 800K bytes of storage and self-test diagnostics.

The week before the announcement of Decmate II, DEC slashed the price of its original Decmate by an average of 45%. No upgrade path is being offered for current users of Decmate, which is software-compatible with its replacement, a spokesman said.

An optional CP/M processor card enables Decmate II to run several CP/M business applications, which DEC will sell and support. The CP/M option is priced at \$495.

DEC is headquartered in Maynard, Mass. 01754.

DEC Micros Target IBM PC

(Continued from Page 1)

computers, observed Aaron Goldberg, research manager for information systems at International Data Corp.

Each Professional 300 system is equipped with 256K bytes of main memory. A planned memory upgrade option will eventually allow the 350 system to be configured with 1M byte of main memory. Both systems also feature dual 5¼-in. floppy disk drives with a total of 800K bytes of storage.

In addition, the 350 offers an optional built-in 5M-byte DEC-designed Winchester drive priced at \$3,500. Other features of the 350 include an optional Telephone Management System (TMS) and an autodial, auto-answer unit with an internal voice digitizer. TMS is priced at \$895.

Operating System

These systems run under the Professional Operating System (P/OS), a new menu-driven software system designed for operation by nontechnical and first-time users.

P/OS was derived from base-level RSX-11, DEC's real-time operating system for PDP-11s. This allows the Professional systems to communicate with PDP-11 and VAX computer systems and use the files resident on those systems, thus permitting the user to share data bases, a spokesman said.

P/OS-RSX compatibility also makes possible applications development facilities through the Professional Developer's Toolkit, a set of languages and utilities that run under

RSX-11M, RSX-11M-Plus and VMS operating systems, according to the vendor.

DEC plans to add direct Ethernet connection and Decnet support for the Professional systems in the near future, a spokesman said. No such communications links are anticipated for the Rainbow or Decmate II systems. However, these lower end systems can communicate with larger DEC hosts, the company reported.

Other Options

Other currently available options for the Professional 300 series include a high-resolution color monitor, a floating-point adapter for faster execution of mathematical operations, a real-time serial/parallel interface, an extended bit-map graphics capability for displaying colors or additional shades of gray and a selection of desktop printers. Printers to be used with the system are the LA50, the LA100 and the LQP02.

The Professional 325 and 350, including the processor, power supply, 256K bytes of storage, a low profile keyboard, a 12-in. monochrome free-standing video display, dual minidisquette units with 800K bytes of floppy disk storage and the operating system are priced at \$3,995 and \$4,995 respectively.

The systems will be ready for shipment the fourth quarter of this year. DEC is offering users several service options for the system, from user-maintenance to full-blown DEC service contracts.

Additional information is available from DEC headquarters in Maynard, Mass. 01754.

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INTRODUCTION TO THE TOOLS OF STRUCTURED ANALYSIS

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Sought Timely, Meaningful Data

First EMR User Reports It's Answer to His Woes

By Lois Paul
CW Staff

TOLEDO, Ohio — "Give us a better information system for management that would provide more timely, more meaningful data."

That was the task assigned to Craig Barrow when he joined Owens-Illinois, Inc. here in November 1979 as director of management reporting.

His solution was to work with Comshare, Inc. on the development of its recently released Executive Management Reporting (EMR) graphics system [CW, May 10].

Owens-Illinois is a \$4 billion corporation that manufactures paper and packaging products in a host of different countries, Barrow explained. The organization's complexity intensified the need for management information. "Different individuals even within the same organization need different levels of detail."

After Barrow analyzed the situation and determined the firm should pursue computer graphics, Owens-Illinois agreed in the spring of 1981 to become a beta test site for Comshare's Execuchart stand-alone com-

puter graphics system and began testing graphics equipment from other vendors. Barrow said his group's chartists found the Execuchart easy to use because it fairly closely approximated the manual methods they were using to develop charts.

The problem Barrow encountered with available computer graphics systems, including Comshare's at that time, was that their orientation did not match his needs. "That's why we had Comshare build the system," he said. Most of the available systems take a finite set of data elements and create charts, but have no administrative function. "Ours, because it is located on a mainframe, is still finite, certainly, but far more flexible than anything that is out there," he said.

Another distinction with the Comshare EMR system is that it uses primarily nonkeyboared instruments — basically an IBM 3279 color graphics terminal or Comshare's own Executive Display Station (EDS). A user employs a light pen with the former and a remote control key pad with the latter.

Before arranging to work with Comshare, the firm put out a 40-page request for proposals that explained exactly what was needed, including voice response and voice recognition. The problem with the latter, Barrow said, is that the technology is not there yet. "The first time the chairman of the board does not get on the system because he has a cold or because he has had a couple of drinks, whatever, it is not reliable enough."

The system that Comshare developed uses magnetic cards and a magnetic card reader. Each user runs his card through the reader to log on and gain access. Once on the EMR system, he can use his light pen or remote control key pad to log off.

The Owens-Illinois graphics system currently is in the final stages of implementation and shortly will be running in production mode, according to Barrow.

The firm is using IBM 4341 mainframes running under the VM/CMS operating system. The EMR package "acts sort of as a switching station whereby data is put into formats, which are presented then to management," Barrow explained.

Terminals Installed

Currently there are about 50 IBM 3270 terminals and two Comshare EDS terminals installed and four of the latter on order. Also included are several Execuchart units.

The EMR package is controlled by Barrow's management reporting staff. This includes administrators who lay out the charts and the paths that will take users to the graphics and authorize user access. Chartists develop and design the charts; data specialists provide reports to update various charts from internal or external data bases. To date, the few users who are testing the EMR system are pleased with it, Barrow reported. His only concern is that once it is fully installed it will be considered the last word in management information systems. "It is merely the first step from our perspective."

Judge Grants Adjournment On IBM Case Dismissal Hearing

By Bob Johnson
CW New York Bureau

NEW YORK — The Justice Department was granted an adjournment here last week on a show cause hearing set to determine whether the dismissal of the U.S. vs. IBM antitrust case should be nullified.

At the request of U.S. Assistant Attorney General J. Paul McGrath, former presiding Judge David N. Edelstein pushed up the scheduled May 19 hearing date to June 21. McGrath, in charge of the Justice Department's Civil Division, asked for the extension so that his office and the Office of Professional Responsibility could

have more time to investigate the issues of the show cause order.

The two major points of the order include questions on whether the case's dismissal was in the public interest and whether the Justice Department's antitrust chief William F. Baxter should have disqualified himself from the case because of consulting work he reportedly did for IBM. This was the second time the hearing has been adjourned. It was first scheduled for April 19 by Edelstein after Philip M. Stern, who presented himself as "a friend of the court," took issue with the dismissal of the case [CW, March 29].

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OTC Net Tied to Exchanges

(Continued from Page 1)

has relatively few terminals at each exchange for interexchange trading, a New York Stock Exchange spokesman said. The Nasdaq system has close to 1,800 terminals across the country, according to Nasd vice-president of systems development Al Casanova. He said Nasd had to develop an interface and "marry" two different systems.

The exchange way of trading is called the "auction" system while Nasdaq is governed by a concept known as the "dealer mart," he said. Nasdaq traders buy and sell for themselves, while personal, as well as agency orders, are made on the stock exchange floor. Reconciling the differences was difficult, he said, adding that the entire process took about a year.

'Big Departure'

Moving away from the manual form of trading practiced on the exchange floors to automatic trading is going to be "a big departure," Casanova commented.

A typical transaction over the merged networks might start with an order from the New York Stock Exchange to buy 100 shares of a given stock. The order would go through one of the Intermarket Trading System terminals and into the Nasdaq message switch, where it would be forwarded to the computer-assisted

execution system, he said.

The order will be automatically executed against the quotations of a market maker who will find the best price for the stock. After execution, an execution notification is automatically returned to both the originating and executing parties.

"The whole process is automatic," Casanova declared. "There is no human intervention at all."

The stocks in the six-month pilot program are the most actively traded among a group of exchange-listed stocks that the Securities and Exchange Commission exempted from rules restricting trading away from exchange floors in 1980.

Analysts said trading of these stocks has been slow — partially because of the lack of a direct, automated link between the over-the-counter market makers and stock exchange traders.

The analysts predict that the difference between asking prices and selling prices will go down as a result of the growing numbers of market makers competing for orders, which, in turn, is expected to reduce the price of stocks.

Casanova said that up to 200 securities may be traded if the six-month test is satisfactory. "There is not a system limitation," he commented. "The Securities and Exchange Commission has put a limit on the types of issues that can be traded."

Computers Hunt Draft Evaders

(Continued from Page 1)

of 98% of all 18-year-olds. Those whose names do not also appear in the Selective Service files will be presumed to have failed to register.

Lamb said the list produced by the match will be sent to the Defense and Transportation Departments, which will identify those on the list who are currently serving in the military services and the Coast Guard and who therefore would not be required to register for the draft.

The narrowed list will then go to the Internal Revenue Service (IRS) for yet another computer match to find the current addresses for those on the list. The Selective Service will then contact those men by mail, advising them they must register and giving them an as-yet-unspecified amount of time to do so.

Expects Compliance

Lamb said the service expects most of those unregistered men to comply with that notification. "I am convinced a lot of them don't know about the requirement [to register]," she said. The names of those who fail to register, as determined by checking incoming registration forms against the original list, will be sent to the Justice Department for possible prosecution.

Failure to register is punishable by fines up to \$10,000 and/or jail terms up to five years.

Use of computer matching to enforce registration is possible because the Selective Service requires Social Security numbers be supplied at the time of registration. That requirement was mandated by a law passed by Congress after the American Civil Liberties Union (ACLU) successfully sued the government over use of Social Security numbers for registration purposes.

ACLU Argument

The ACLU argued that use of those numbers violated the 1974 Privacy Act. Despite the specific law now allowing that use, the ACLU is still pressing its suit, presently in federal court here, because the union feels the law contains "some ambiguity," according to ACLU Legislative Counsel David Landau.

Landau noted, for example, the ACLU believes the statute does not cover those who registered without giving Social Security numbers before the law was passed. "The legislation was not drafted well; it's not clear on several points," he said.

The ACLU, through its local chapters around the country, is also fighting registration enforcement plans by trying to keep from the Selective Service other types of computer lists the service hopes to match against in order to identify those who have not registered and who are not covered by the Social Security files.

Lamb told *Computerworld* the agency will start gathering commercial lists of high school graduates and various other files, such as state driver license tapes. According to Landau, the Selective Service has been able to obtain only a few such lists, but Lamb explained that the agency has not yet made any great effort to get them.

Is This the End or Just the Beginning Of High-Technology Draft Registration?

This American Civil Liberties Union/Selective Service dispute appears to be the last major remnant of a years-long controversy over high-technology draft registration.

When the move to resume registration got underway in 1978, the congressional Budget Office and the General Accounting Office both recommended using computer lists already in government control to actually perform the registration.

This "passive" registration plan was opposed by the Carter White House and on Capitol Hill because, it was argued, it might violate pri-

vacy laws, it would be inequitable because not all draft age males could be identified through existing files and because if Internal Revenue Service files were to be used many might fail to pay taxes so that their tax records could not be used to make them liable to be drafted.

Carter Recommendation

Carter recommended, and Congress adopted, a return to face-to-face registration. Use of government computer files to enforce the registration was subject to the same counterarguments, but no decision one way or the other was made un-

til late last year, because President Reagan was considering ending the entire draft registration program.

When Reagan decided to continue registration, the Selective Service sought, and Congress approved in December's defense authorization legislation, authority to require Social Security numbers and to access existing federal computer files.

As an added twist, the new law also permits the Selective Service to disclose to the Defense Department information supplied by registrars — data that may then be used in military recruiting efforts.

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DG Expands 16-Bit CS Line With Four Systems

(Continued from Page 1)

Although comparable in price to the CS/70, the CS Series 200 is said to be three times as powerful and can support up to nine more terminals than the previous high-end machine. At its highest capacity, the CS/70 is limited to 16 terminals, a DG spokesman said, noting that exact numbers

are based on the user's choice of operating system and applications.

The Series 200 can be supplied either with the compact Microclipse or the more powerful standard Eclipse processors. The Series 200 with the Microclipse processor features 256K bytes of memory, expandable to 512K bytes, and can support

up to 13 terminals. The Series 200 with a full Eclipse processor offers from 256K- to 1M bytes of memory, the spokesman noted.

The basic system can also handle up to 638M bytes of nonremovable Winchester disk storage. However, large data systems can add up to four additional 277M-byte disk drives, delivering a total data storage capacity of 1.4G bytes.

Supports Dasher Units

The CS Series 100, which is less powerful than the Series 200 but still reportedly performs better than the old CS/70 machine, also features the Microclipse processor and has up to 512K bytes of memory. The system can support up to nine DG Dasher terminals — as opposed to the previous limit of four. Up to 50M bytes of disk storage can be added to the system in Winchester configurations ranging from the firm's just-introduced 5M-byte model to its 25M-byte units, the spokesman explained.

The Series 100 is targeted for new users who are moving from manual accounting systems, service bureaus or business-oriented personal computers, he added. Finally, the entry-level CS/5 computer — a single-terminal desktop system — consists of a 16-bit Micronova processor with 64K bytes of random-access memory, a CRT terminal, two floppy disk drives and a keyboard. The system is equal in performance to the previous entry-level CS/10 machine.

The CS/5's floppy disks deliver up

to 716K bytes of storage. The system has two RS-232C I/O ports that can be used to link the computer to peripherals or to other DG computers, allowing the device to be used as a remote station. Communications is accomplished at rates up to 19.2K byte/sec, the spokesman said.

The CS/5 utilizes the firm's MP/OS operating system and supports such high-level languages as Business Basic, Interactive Cobol and MP/Pascal, he noted. It can also use the firm's IBM-oriented MP/RJE80 and MP/3270 communications products.

The CS Series 100 and Series 200 use DG's Rdos and both Rdos and AOS, respectively. Since all the systems are compatible at a language rather than at an operating systems level, programs can be switched from one system to another as the user migrates to more powerful machines.

Packaged systems range in price from less than \$11,000 to less than \$100,000. For example, an entry-level CS/5 with the MP/OS licence, a runtime language license, CRT, keyboard and diskettes and 5M-byte Winchester drive costs \$10,650. The systems are available for delivery in 90 days. Present CS users will be able to upgrade to the new systems, most likely through a board-swapping arrangement. However, exact details and pricing on upgrades are not yet available.

Additional information can be obtained from DG, 4400 Computer Drive, Westboro, Mass. 01580.

DG Unveils Interactive Software Along With Expanded CS Series

WESTBORO, Mass. — Data General Corp. here announced three interactive software packages along with its expanded Commercial Systems (CS) computer series (story above).

The products that were announced with the new CS line are Busitext, a user-friendly word processing package; Busipen, graphics software for generating pie, bar and line charts; and Busigen, a program and report generator, the vendor said.

Busitext, the firm's first integration of word processing and data processing, is said to improve writing, accuracy and management of business

documents. It includes on-screen editing functions, text and data merging and insertion and deletion routines.

Busipen enables users to transform tables and data into charts by reportedly using a few user prompts.

Busigen allows users to define a programming task, respond to queries and develop reports — all without a working knowledge of a programming language, the spokesman claimed.

The initial software costs from \$1,900 to \$2,950, with subsequent licenses for identical packages costing from \$250 to \$1,000, the vendor said.

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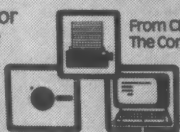


Even a first-time user can operate the system, which has easy-to-understand screen directions, and which automatically edits input files as data is entered. (A user-training program is available.)

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GTE VP Wears Many Hats

(Continued from Page 1)

burgeoning world of GTE's internal telecommunications and office automation systems. He also presides over "headquarters information management services," which refers to DP services for the various corporate groups located in the GTE world headquarters in the Greater Stamford area.

"I don't run data centers, and all of the data processing people throughout GTE don't report directly to me," the graying and erect vice-president explained.

They may not report directly to him, but they certainly talk to him when contemplating new directions. McElroy advises them on the most effective, least expensive tools for their needs and offers constructive criticism of overall plans. One pet project is an evolving corporate communications network. The first phase has been dubbed "GTE Voicenet" and is being implemented this year.

Still to come are data communications, teleconferencing and image capabilities. McElroy, who is married and has three children between the ages of 21 and 25, has been at GTE 12 years. The road to his current position led him through the ranks as machine accounting manager, programmer, systems analyst, programming supervisor, data processing director for telephone operations, vice-president of operations for GTE data services and vice-president for GTE data systems.

McElroy is aware of the problems technical people often encounter in

management areas. He cited DPer's high need for feedback, but praised them for being well disciplined and structured. On the negative side, he said, ambitious DPer's should strive more to acquaint themselves with the business environments of their companies. "In short, I think they need a somewhat broader perspective," he commented.

What about his management style? "I would say it tends to be analytic, that it presupposes a heavy commitment to the job. I'm a great believer that most management positions require a heavy energy level and you've got to be committed to the job — and I'd say I am."

Despite the fact that McElroy shed his coat to talk, the vice-president has a formal, almost military bearing about him (he served in the U.S. Army Signal Corps). Backed by CRT terminal, multiple-line telephone and acoustic coupler, it's easy to imagine him being on-line to the Joint Chiefs of Staff.

But appearances can be deceiving. The vice-president is easygoing and a fluent conversationalist. And unlike most generals, he prefers to persuade and reason rather than "dictate and pound on the table."

"I'd say I am people oriented and empathetic," he observed.

When asked what he likes most and least about his job, McElroy waxed enthusiastic over the opportunity to make a meaningful impact on GTE. What he doesn't like is the limited impact he is able to achieve on a companywide level.

CW Polls N.Y. Metropolitan Area

End Users Say Computers User-Friendly: Survey

By Bob Johnson

CW New York Bureau

NEW YORK — End users not only regard computers as "user-friendly," but actually take them for granted.

That is what *Computerworld* learned from a recent New York metropolitan area telephone survey aimed at determining how non-DPers feel about using their systems.

The nine respondents surveyed agreed that compared to the main-frame environments prevalent in large companies years ago, the on-line systems of today that supply hands-on interaction "demystify" the workings of computers.

Gomy Smeraldi, a computer services officer in the valuations department of the U.S. Trust Co. of New York, said that his department views its use of the computer as a commonplace working procedure. He said employees have no trouble interfacing with the system and have a fairly good understanding of how information is processed. He attributed their success to good user education supplied by the DP department.

"Our people feel the system is user-friendly and I think it's evident in the way they work," he said. "I might be biased because my background was in DP, but I feel using the computer is a smooth chore. At times though, I'll be asked if we can send a man to the moon, why can't we get a particular job done?"

When asked how workers view the system as a whole, Smeraldi said: "The new people are sometimes awed by how it's all done, but the veterans take it for granted."

Sally Gangi, an end user and manager of payroll services at S&H Green Stamps, said that in 17 years of working in payroll areas she has seen a steady improvement in the user friendliness of computers. "I enjoy working with the systems and I can see the improvements that are constantly being made. Throughout my career I witnessed different systems and the one I use today at this company is the most pleasing in terms of ease," she said.

The manager revealed, however, that the latest version of the software package used by S&H has not been

implemented and she admitted that the system would be even more user-friendly if it were.

Gangi agreed that at times her area thinks the computer can do everything and that the machine is taken for granted. She said that employees tend to look at the computer as "all-knowing." "We sometimes forget that it is only as good as the clerk doing the inputting," she pointed out.

Similarly, Maureen Haugh, a supervisor of data entry clerks at the Equitable Life Assurance Co., said that people often think the computer is infallible. "Using a system makes things a lot easier," she said, but added that a prevailing attitude among

workers is that the computer is and always was available.

She explained that workers are inclined to think less now that computers are so simple to operate and do a lot of the manual work. "There is a lot to gain by using computers but you can lose some experience by not doing things manually," she said.

Commenting on her understanding of how computers operate, Haugh said she understands the common sense aspects but could not appreciate what goes on internally in the machine.

User friendliness is an integral part of the operation of the accounting area according to Jill Brower of Sea-

Land Industries, Inc.

Brower, a supervisor in the company's accounting section, noted that her department is concerned with balancing accounting reports so there is no room for problems with computer systems comprehension. "We have a fairly good understanding of how our systems operate. We have a good rapport with our systems people and that helps."

The supervisor pointed out that because the systems are so user-friendly, workers sometimes forget to think. "There is definitely a lack of understanding of the total work function when there is an absence of manual work," she said.

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Placement Service Utilizes Data Base

WOBBURN, Mass. — A computerized placement service that matches the requirements of hiring organizations with job seekers' qualifications has been established here by Career Match, Inc.

Client organizations pay a fee based upon the level of position salary — anywhere from \$25 to \$50. The resume goes into Career Match's data base, and organizations are charged for access to "matched" resumes. The companies pay for the first ten resumes only; additional resumes are sent free.

Initially the service is focusing on the New England region and is specializing in placing data processing, accounting, finance, office and administrative personnel. Career Match is at 21 Cummings Park, Woburn, Mass. 01801.

'Relational' Remains Buzzword, Not Practice

By Marcia Blumenthal
CW Staff

Relational data base management systems (DBMS) have been a major buzzword in the computer industry for the past few years, but only a handful of companies have introduced relational systems.

Instead, in recent months most major independent IBM-compatible DBMS developers have made the file

structures of their systems appear relational-like to the user.

Vendors have become locked into existing technology, observed Ronald G. Ross, editor of the "Data Base Newsletter." They now have a sizable user base and good revenues

Industry Spotlight

from existing products.

However, what is needed is a "giant leap strategy," a move that involves radical changes in products, he contended. These changes will have to be so substantial from a product standpoint that users will be willing to make the necessary conversion.

One of these radical changes has been IBM's introduction of SQL/DS, which many observers have said is the core of its long-rumored System R. The problem with relational systems is that they do not readily lend themselves to large computing installations, according to Dr. E.F. Codd, an IBM Fellow generally acknowledged to be the father of relational systems.

Two relatively new companies, Relational Technology, Inc. (RTI) and Relational Software, Inc. (RSI), have been marketing, respectively, Ingres and Oracle DBMS relational products, primarily to users of Digital Equipment Corp.'s VAX-11 and PDP-11 systems. However, RSI has now adapted its Oracle DBMS to IBM systems running under VM, CMS and MVS, Larry Ellison, RSI's president, noted. This product is now in beta test and will be release in June.

Ellison contends that relational systems can perform well on high-end systems. "Early relational systems were not designed to be commercial products, having been developed at universities," he explained. However, high-end commercial systems are feasible using sophisticated storage techniques. These systems, he added, can use all the storage technology of IBM's IMS.

Integrated DBMS Grows Up

(Continued from Page 1)

cessing monitors, data dictionaries, query languages, procedural or non-procedural applications developers and report writers.

Beyond these features, now considered nuts and bolts of DBMS, vendors are enhancing products to make the system easier for both casual and professional users to manipulate.

Easier Development

These features are "another part of a facilitative package that makes the development of applications easier," Alex Kuli, manager of corporate marketing for Cincom Systems, Inc., noted.

In the past six months Kuli has found that Cincom's Mantis applications development product, rather than its mainline data base product, Total, is becoming the lead into DBMS sales. "Our sales approach has had to reflect that change," Kuli reported, noting that the firm has begun offering users seminars on applications development as well as seminars on DBMS.

Although many DBMS vendors have concentrated on making products easier to use for the DP-oriented worker, many vendors are now also making products accessible to "the casual user" of the data base — someone who may only have a need to query the data base once a week. Increased high-level query language capability is leading this trend, Edwin C. Millsap, vice-president and group product manager of Applied Data Research, Inc. (ADR), said.

Cullinane Database Systems, Inc. has also been exploring the possibility of allowing users to develop "personal data bases" that can be incorporated into standard production-type data bases, Robert Goldman, the firm's executive vice-president, noted (see chart).

Driving Force

One of the driving forces behind making DBMS more accessible to users is vendors' attempts to make systems more "relational-like."

Although the controversy still rages between the virtues of true relational systems vs. systems that exhibit relational qualities, most vendors have jumped on the relational bandwagon in the past few years by modifying systems to at least offer users a relational view of the data contained in the DBMS (see related story).

Developers of DBMS are responding to the technology, Cullinane's Goldman observed. The latest release of IDMS contains a Logical Record Facility that allows users to look at a

record as a flat file.

Besides incorporating relational views of data, DBMS vendors are looking at distributing data bases that would allow users to access the appropriate data base without regard for where the data is stored.

Cincom, ADR, Computer Corp. of America (CCA), Software AG and Infodata Systems, Inc. are among the vendors prototyping or incorporating distributed data base technology into their products. Although vendors have demonstrated the ability to allow users to transparently access data from data bases distributed in several locations, a satisfactory means of concurrently updating the data base is still considered by most vendors as a hindrance to the widespread use of distributed data bases.

Nonetheless, users are demanding this capability. "Companies want to write programs for five or 10 years out and don't want to be concerned about where the data is," ADR's Millsap observed.

Data Base Access

Besides the ability to distribute, some DBMS vendors want their users to have the capability of accessing different vendors' data bases. CCA is working on a query language that will interface into the query language of other data base developers' systems, Larry R. DeBoever, director of data base products, reported.

Although CCA's data base research has for a long time been funded heavily by the Department of Defense, in the past three years the company has turned its attention to the commercial market.

Information Builders, Inc.'s Focus product has the capability of reading IDMS, IBM's IMS and Software AG's Adabas files, Gerald Cohen, the firm's president, said. Some DBMS experts do not recognize the Focus system as a pure DBMS. However, other industry experts tend to view the product as a specialized DBMS system that concentrates on application and report generation rather than on data management.

DBMS developers are no exception to the emerging fascination of other vendors in the computer industry with personal computers. Many are closely eyeing the potential of tying personal computers to DBMS.

Infodata Systems, Inc., for example, is exploring the possibility of putting a subset of Inquire on IBM's Personal Computer, Harry Kaplowitz, executive vice-president of Infodata, reported. And one of Cincom's users is developing a network using Apple Computer, Inc.'s systems tied to a mainframe to do modeling, Kuli explained.

MAJOR INDEPENDENT DEVELOPERS OF IBM-

Company	Revenues ²
APPLIED DATA RESEARCH, INC. Datacom/DB (250 installations)	\$52 million (Estimated 20% from data base products.)
CINCOM SYSTEMS, INC. Total (Total — 5,200 installations) (TS — 25 installations)	Not Available
COMPUTER CORP. OF AMERICA Model 204 (125 installations)	\$7 million
CULLINANE DATABASE SYSTEMS, INC. IDMS (1,000 installations)	Estimated \$47 million to \$49 million Fiscal year ended March 30.
INFODATA SYSTEMS, INC. Inquire, IQ/Net (Both systems — 300 installations)	\$7 million
INFORMATION BUILDERS, INC. Focus (350 installations)	\$10.5 million
INTEL CORP. System 2000 (700 installations)	\$788.7 million (Very small portion from data base.)
MATHEMATICA PRODUCTS GROUP Ramsis II (More than 600 installations As of June 30, 1981)	Fiscal year ends June 30. Estimated MPG revenues \$18 million of total estimated corporate 1982 revenues of \$40 million
SOFTWARE AG Adabas (900 installations)	Estimated \$25 million (Fiscal year ends May 30.)

Faced With Make or Buy Decision

Vendors Interface Separate Packages With DBMS

By Marcia Blumenthal
CW Staff

Although today's data base management systems provide internal features or specialized products for applications development, some vendors have opted to interface separate applications packages with their DBMS.

Ironically, the same make or buy decision users face in acquiring applications packages also applies to vendors. Cullinane Database Systems, Inc. is one of the major proponents of the buy approach, while Cincom Systems, Inc., to date, has developed its own application software.

Other vendors are also considering the feasibility of interfacing application software with their systems and these companies think a combination

Industry Spotlight

'Ironically, the same make or buy decision users face in acquiring applications packages also applies to vendors. Cullinane Database Systems, Inc. is one of the major proponents of the buy approach, while Cincom Systems, Inc., to date, has developed its own application software.'

of making and acquiring applications is the appropriate strategy.

Under its Integrated Application Service, Cullinane has acquired the rights to three packages: a customer information system, a manufacturing system and McCormack & Dodge Inc.'s General Ledger system.

Moreover, the firm recently provided an IDMS interface that allows communication with Computer Pic-

ture Corp.'s analytical graphics systems.

A major drawback of this strategy, according to other DBMS vendors, is its expense. Cullinane spent \$1.3 million adapting McCormack & Dodge's system, which in effect was almost as expensive as developing a system from scratch, according to Robert Goldman, executive vice-president. "But the system functionally has ev-

everything. With a new product you can't design everything the first time around. What we are doing is rewriting systems, leaving the functionality intact."

Adapting existing packages is expensive, "once you touch any of it, it becomes like a set of dominos," according to Alex Kuli, manager of corporate marketing for Cincom.

However, Cincom's in-house developed manufacturing package, developed about three years ago, was also expensive. The company spent \$4 million on the system in the past year, Kuli reported.

"Building a product is nothing, but selling and supporting it is expensive," remarked Donald M. France, senior vice-president of sales and marketing for Software AG.

His firm is also interested in interfacing applications to Adabas. Software AG is looking at joint relationships to sublicense its product to other software vendors. The company hopes to have 20 sublicensing arrangements within the next year, France said.

Infodata Systems, Inc. has interfaced some packages to its Inquire system, such as SAS/Graph from SAS Institute, Inc., but Harry Kaplowitz, the firm's executive vice-president, explained that these applications have to be more "closely coupled" to its system. In the future, Infodata will be developing tighter interfaces between its system and selected applications packages. Information Builders, Inc. is taking a slightly different tack. It is using its Focus product to build, for example, 80% of a specific application, leaving the other 20% for the user to customize, according to Gerald Cohen, the firm's president.

Seed Designed To Operate On IBM CPUs

Until recently, International Data Base Systems, Inc. (IDBS) has targeted its Seed data base management system to the minicomputer market, but the firm has now adapted the system to run on IBM processors under MVS and VM/CMS.

Seed was adapted for IBM systems two or three years ago, Herbert A. Edelstein, IDBS vice-president, reported. But it has only been in the last year that the firm has taken the adapted system to the marketplace. Edelstein said the company has six IBM-compatible Seed systems installed.

Like its more established counterparts in the IBM-compatible world, IDBS has moved to interfacing Seed with facilities needed by users. The company has tied Seed and its query language, Harvest, to perform color graphics applications. This facility, Rainbow, will soon be available for IBM systems, Edelstein reported.

And although Seed is a Codasyl system, the user has a flat file view of the data.

One of the major new directions at IDBS is creating automated data base design aids, he said.

COMPATIBLE DATA BASE MANAGEMENT SYSTEMS¹

Recent Activities and New Directions³

- ADR is in the process of integrating the components of Datacom/DB; e.g. now merging its Librarian control system and data dictionary into the data base.
- ADR/Ideal: a total interactive on-line development environment using high-level, relational-like processing language. In beta test. Will be available to users early next year.
- Datacom/D-Net, to be released mid-year, supports distributed

data bases at different locations. This facility allows the user to transparently access data bases in different locations.

- Providing interfaces to vendors for applications products. Has made arrangements with Management Science America, Inc. and Conserv Corp.
- An ADR-developed financial modeling application called Empire will be integrated with the data base system.

- Developing high-level front-end software system to allow easy use of IBM's GDDM graphics software. Moreover, according to Cincom, IBM will phase out its 3279 terminal in favor of a plasma display and Cincom's front end will allow users to access GDDM with any type of hardware.
- Exploring the tying of personal computers into mainframe data

base. Working with one user to develop an Apple Computer, Inc. network to use information in data base to do modeling applications.

- Has prototype of distributed data base which is a single logical view of data bases stored in multiple locations. Read-only mode at present.

- Downscaling to DOS systems; availability fall 1982.
- Text 204 will be integrated into data base product to be available fall 1982. Allows the integration of text and numeric data and provides full text retrieval. Update text documents in place without having to replace existing document.
- Developing "post-relational data model" — all features of relational and network data models will be integrated into a functional data model.

- Exploring fifth-generation end-user facilities for implementation of artificial intelligence technology to applications and data base query. Funded by the U.S. Defense Department.

• Developing a universal conversion tool called Multibase that links together all data base systems into a centralized logical view. Single query language would interface to query language of any other data base system.

- Integrated system has been a major thrust of the firm. Last October the firm announced IDMS-82, which integrates major features of the firm's data base system, including several application packages.
- Cullinane is the major proponent of acquiring packaged appli-

cations and integrating them with IDMS. Most recently the company interfaced IDMS with Computer Pictures Corp.'s analytical graphics system.

- Exploring the development of an end-user data base system (similar in concept to Focus and Ramis II).

- Increasing user friendliness of system. Introduced data dictionary last year and is integrating it into data base systems.
- Strong interest in developing distributed data bases. Right now can access multiple data bases, and working on the ability to update concurrently multiple data bases.

• Presently has applications loosely coupled to data base system, e.g. SAS Institute, Inc. statistical package; but will more tightly couple applications.

- Exploring tying personal computers to data base system stored in mainframes.

- Exploring adapting Focus to hardware systems other than IBM.
- Increased attention to building "miscellaneous" specialized applications. To this end, the firm sees itself developing 80% of the application, such as a coupon tracking system for grocers, which will be developed 80% by Information Builders and then custom-

ized by users.

- Expanding the multiuser capability of the machine, allowing multiple users to read and write the file at the same time.
- Interfacing Focus with Isco's Tellagrat system.

- Geared to the technically oriented user, Intel is focusing on development tools. During the past year introduced a number of multiuser capabilities.

- Developing more capabilities for user to span multiple data bases and data bases from different vendors.
- Exploring the coupling of Intel's newly introduced data base

processor with System 2000 to further deploy local ownership of data for specialized applications by user departments within the organization.

- Making English-like commands for professional user more powerful.

- Commitment to increase the linking of components of its system into a tight, coherent system to improve performance. Has integrated its data dictionary to system. Has integrated a communications interface to IBM DOS systems that MPG claims increases response

time by 50%.

- Adapting artificial intelligence techniques to simplify user friendliness of language and make it more robust.

- Looking to develop an integrated package of network-oriented facilities that provide links to allow multiple data bases to talk to one another and which will be transparent to any teleprocessing monitor. Channel-to-channel software (now used in data base machine product) would be a key component of such a package. Final release of Adabas Vtam, which allows multiple Adabas users to talk across a network, would be a component of such a system.
- Exploring "survivable" systems — a nonstop-type approach —

to ensure availability of data at peak loads. Not sure it can be totally integrated with software, but could be integrated with some intelligent switching devices.

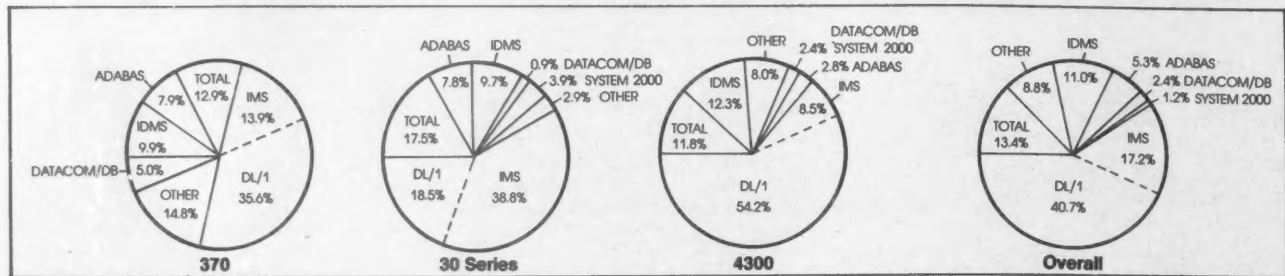
- Looking at joint relationships for sublicensing Adabas to application software firms which will tie Adabas to applications. Software AG does not intend to market the applications. Expects to have 20 such arrangements in the next year.

1.) The companies described in this chart are not an exhaustive list of firms in the data base management system (DBMS) market, but rather represent the vendors considered by industry experts and market research firms to be the major IBM-compatible DBMS vendors.

2.) Latest fiscal year, unless stated otherwise.

3.) Information supplied by vendors.

DBMS Installed for 46.5% of IBM Users in 1981



International Data Corp. Chart

Data Base Management Systems Used at IBM 370, 30 Series and 4300 Sites as of October 1981

By the end of 1981, 46.5% of users of IBM and IBM-compatible systems had data base management systems (DBMS) installed, compared to 43%

of users in 1980, according to John Worthen, executive vice-president of Focus Research Systems, Inc. of Hartford, Conn.

IBM's share of the market for its DL/1 and IMS systems for the 8,000 users surveyed by Focus has been holding steady at about 52% for the

past five years, he said.

While the OS market is somewhat saturated, the DOS market, particularly for 4300 systems users, offers good market potential for DBMS vendors, researchers point out. Focus estimated 28% of 4331 users have DBMS systems installed, while 50%



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Industry Spotlight

users are currently using items.

As of last October, 40.7% of the users of DBMS systems run on IBM 370, 30 series and 4300 processors had installed DL/1 while 17.2% of those users were running IMS, according to estimates from International Data Corp. (IDC) (see accompanying chart).

Of the overall installed base, IDC estimated the share of the top independent vendors was as follows: Cincom Systems, Inc.'s Total — 13.4%; Cullinane Database Systems, Inc.'s IDMS — 11%; Software AG's Adabas — 5.3%; Applied Data Research, Inc.'s Datacom/DB — 2.4% and Intel Corp.'s System 2000 — 1.2%. Other independent vendors garnered a total of 8.8% of the installed base.

While Total has generally been the most popular independent system selected by users, Worthen said in 1981 the frequency of new installations of DBMS was IDMS, Adabas, Datacom/DB, System 2000, with Total bringing up the rear.

Genesys Plans Users Meet

SEATTLE — Genesys Software Systems, Inc. will be holding its Spring Human Resources Management Systems Users Conference here May 19-21.

Sessions have been scheduled for users of Genesys' custom-generated payroll, personnel, and benefits management software. These will include implementing employer-sponsored IRAs, alternatives to employer-sponsored IRAs, the impact of 1982 sick pay legislation and Genesys' enhanced EEO/AA reporting system. Also featured will be a session on All-Screen, the company's recently unveiled terminal-oriented, direct access data entry and inquiry system that is on-line and interactive.

Genesys can be reached at 10 Grafton St., Lawrence, Mass. 01843.

Justice Summary Due May 20

Judge Extends AT&T Antitrust Review Deadline

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — The Justice Department has won more time to review the flood of comments it has received about the tentative settlement of the government's antitrust case against AT&T.

The deadline for reviewing the comments and reporting to U.S. Federal District Court Judge Harold Greene, who is presiding over the dormant trial, has been moved from May 5 to May 20.

More than 600 organizations have filed comments so far with remarks that fill nearly 9,000 pages. This is the raw input for the summary the Justice Department is preparing.

FCC Goes to Greene

The Federal Communications Commission (FCC) will present its comments to Judge Greene directly, rather than via the Justice Department.

Bill to Regulate Overseas Service

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — An international communications bill that would allow AT&T to offer nonvoice services overseas and permit the Communications Satellite Corp., now a "carrier's carrier," to market its offerings directly to end users, was introduced by Sen. Barry Goldwater Sr. (R-Ariz.), Senate communications subcommittee chairman.

The bill, S. 2469, is being cosponsored by the ranking Republican member of the subcommittee, Sen. Harrison Schmitt of New Mexico, and by the ranking Democrat on the parent Senate Commerce Committee, Sen. Howard Cannon of Nevada. Goldwater said consideration of S. 2469 will begin next month.

One key provision of the Goldwater bill would require any U.S. international carrier providing regulated service to interconnect with "any carrier, facility, equipment or private system upon reasonable request and pursuant to nondiscriminatory terms and conditions."

Other Provisions

Other provisions of S.2469 include:

- Within 30 days after enactment, the Federal Communications Commission (FCC) would classify all international services as regulated, and thereafter the commission could deregulate individual offerings "as they become subject to effective competition." The ultimate goal is to regulate only dominant carriers.
- Neither resale nor shared use of international telecommunications services would be subject to FCC regulation. Dominant carriers would be allowed to offer such services, but only through fully separated affiliates operating under accounting and other rules specified by the FCC.
- The FCC would be empowered to deny foreign carriers access to the U.S. telecommunications market if they attempted to discriminate domestically against U.S. carriers.

"We expect, as a result, that Judge Greene will read our comments in full rather than as part of a summary," a commission spokesman said.

One of the commission's major recommendations would allow Bell operating companies to offer terminal equipment, intercity services and enhanced, computer-based information services. Under the agreement worked out by Justice and AT&T attorneys last January, the operating companies would be able to offer only local exchange and local exchange access services. Allowing them to enter the smart network business and offer intercity communication services in competition with

AT&T Long Lines Division is opposed by many computer services vendors, who fear that such action will make it harder to separate AT&T Long Lines from Western Electric and Bell Laboratories.

This latter provision, although not in the proposed consent decree, is incorporated into H.R. 5158, the telecommunications bill now pending in the House of Representatives. "If Judge Greene goes along with the commission on expanding the [Bell operating companies'] charter," one source said, "the chances of preserving the separation provision in H.R. 5158 will be drastically reduced."

Besides granting the Justice Depart-

ment more time to summarize the comments of interested parties and allowing the FCC to submit its recommendations directly, Judge Greene amended the original rules concerning publication of this material. Now, instead of publishing all the comments in the Federal Register, Justice will publish only the authors' names and addresses.

A copy of each comment will be available at district offices. Additional copies can be obtained for one cent per page or on microfilm for \$15/reel. For further information, write Eric Donovan, U.S. Department of Justice, Antitrust Division, Room 1028 Safe, Washington, D.C.

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During COMPUTERWEEK, a national conference presented by the publishers of *Computerworld*, *Computer Business News* and *Infoworld*, DELTAK videotaped a broad range of sessions by industry experts sharing their insights into business personal computing. These sessions are now available as a Conference Journal, *Personal Computing: A Business Perspective*, exclusively from DELTAK, the world's leading producer of video-based DP and management training programs.

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GAO: Government DP Security Deteriorating

By Jake Kirchner

CW Washington Bureau
WASHINGTON, D.C. —

Federal agencies are relying on data processing and telecommunications more and more, but according to congressional investigators, the government has done little or nothing to resolve its long-standing DP security problems.

The General Accounting Office (GAO) has been hounding federal DP policy officials for years about inadequate systems security. But in a recent update of its studies in this area, the GAO found the problems to be growing rather than diminishing.

Pointing to earlier investigations that found security deficiencies in government DP, the report said current conditions "demonstrate that little change or improvement has occurred."

The situation is deteriorating, according to GAO, because of the rapidly escalating use of computers in federal activities.

"The increasing federal investments in automated information systems result in increased vulnerabilities for fraudulent, wasteful, abusive and illegal practices because greater concentrations of information are accessible from remote terminals," GAO told the House government information subcommittee.

Little Security

In general, the report stated, central federal oversight agencies have not fulfilled their responsibilities for ensuring adequate computer security and most executive agencies "are doing little" to implement what security program policy does exist, the report said.

The GAO placed most of the blame for this situation on the Office of Management and Budget (OMB), ac-

Beal to Keynote DSS-82 Meet

SAN FRANCISCO — Dr. Richard S. Beal, special assistant to the President and director of the Office of Planning and Evaluation at the White House, will be the keynote speaker at DSS-82, June 14-16 at the St. Francis Hotel.

Sponsored by Execucom Systems Corp., the conference will focus on decision support systems including management, development research and products issues, the firm said.

Execucom Systems Corp. can be reached through P.O. Box 9758, Austin, Texas 78766.

curring that agency of inaction and pronouncing OMB's standing DP security guidance document inadequate.

That guidance "is not sufficiently comprehensive," GAO said, adding its deficiencies "have left some executive agencies confused as to the nature and extent to which the memorandum is to be implemented and its application to technologically complex automated infor-

mation systems, particularly those using telecommunications networks."

In addition, the GAO report charged that "other than issuing [policy documents], OMB has not taken any further action to ensure the executive agencies' effective implementation of their information security program plans."

The report recommended a number of actions for the

central oversight agencies — OMB, the National Bureau of Standards and the General Services Administration as well as the Office of Personnel Management.

Summer Deadline

Those agencies have until the end of the summer to comment on the report's findings and recommendations, according to the report.

The GAO follow-up was performed at the request of the former chairman of the government information subcommittee, Rep. Richardson Preyer (D-N.C.).

According to the subcommittee, when the agency comments are received, the panel, under the direction of the new chairman, Rep. Glenn English (D-Okla.), will again take up the subject of federal DP security.

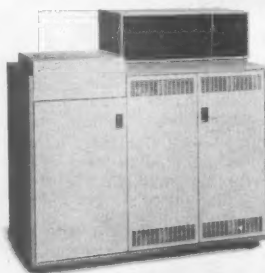
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'No Rush'

Edelson Sees AT&T Cautiously Joining DP Mart

By Tim Scannell

CW Staff

TARPON SPRINGS, Fla. — While the settlement of AT&T's 12-year-old antitrust suit has opened new doors for Ma Bell to compete in the highly active data processing market, the world's largest company "is in no rush to get into computers."

However, freed from gov-

ernment control, the leaner and meaner AT&T has adopted a "get tough" attitude and will "aggressively work to put the competition out of business," according to Harry Edelson, a vice-president with First Boston Corp.

Speaking here recently at a conference sponsored by Enterprise Information Systems, Inc., Edelson told a

lunchtime crowd of executives from most of the major computer corporations where he thought AT&T might go in its new capacity as a virtually unregulated information company. Surprisingly, he drew a picture of a tough and aggressive firm that will most likely move with caution rather than boldness.

Focusing on the computer industry in general, Edelson also offered a few comments on the present slump among minicomputer vendors and the rising competition in personal computers.

Despite rumors that AT&T will hotly contest any changes the government decides to make to its earlier settlement agreement, Edel-

son insists that the firm will "swallow its pride and agree to any recommendations."

"It's a 100-to-one shot that the judge [Judge Harold H. Greene] will offer changes," Edelson said. "They're not going to just sign the agreement and say, 'that's it'."

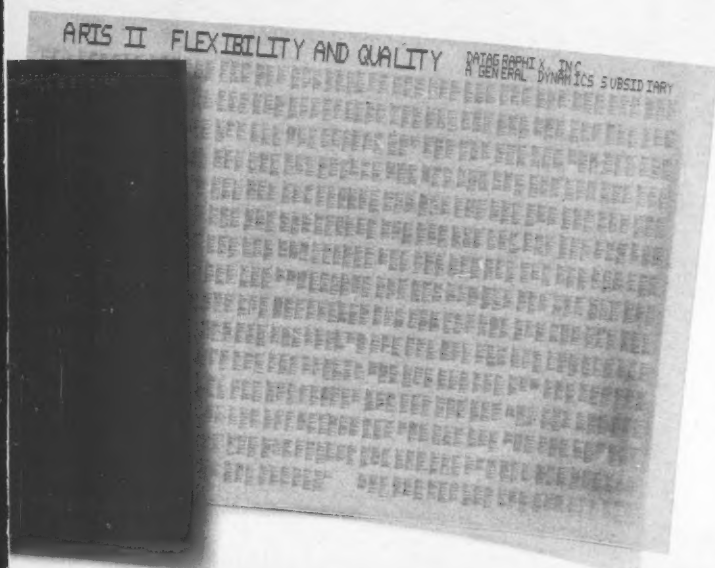
Some 9,000 pages of comments on the antitrust settlement have already been submitted to the Justice Department, which is due to submit a summarization to Judge Greene later this week. Greene's decision will be based on these comments and input from other sources, including the Securities and Exchange Commission.

First Boston's financial expert observed that although AT&T watchers believe that actions by the House of Representatives Telecommunications Subcommittee and its bill, H.R. 5158, could add restrictive measures to the initial settlement agreement, the House legislation "will never see the light of day." While AT&T does not have the power to have legislation passed, it does have the lobbying power to have certain legislation killed, he said. If anything is passed, it will be the "watered down" bill offered by the Senate called S. 898, which is basically a rewrite of the Communications Act of 1934.

How will AT&T perform in its new competitive role? For one thing, it has adopted a new attitude toward marketing its telecommunications equipment, Edelson stated. Borrowing a sales lesson from the computer industry, the firm reportedly cut marketing salaries by 25% and promised to return that sum on a commission basis. The traditional game of "You Bet Your Paycheck," Edelson quipped.

As expected, the firm will develop and sell equipment that offers a variety of data processing features, such as switchboards that also act as complete computer systems. However, AT&T will not dive into data processing without thoroughly testing the industry waters. The firm remembers the days when it once led the teletypewriter industry — capturing nearly 100% of the market — only to later lose that lead to IBM.

AT&T has about 2,500 telephone stores that could easily be transformed into computer stores, selling a variety of computers and peripherals, the financial analyst said. "These days, AT&T and IBM are not too proud to sell other manufacturers' equipment."



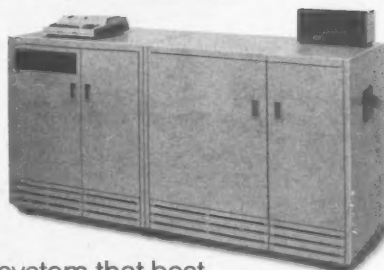
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Japanese Financing Fifth Generation As Technical Savior

By Tim Scannell
CW Staff

TARPON SPRINGS, Fla. — Computers should be easy to use, highly intelligent, have sophisticated communications capabilities and some degree of common sense. But, can they be the technical saviors of the human race?

The Japanese government and eight major electronic and computer manufacturers in Japan think so. In fact, they are betting 10 years of research and tens of millions of dollars on a project to develop a fifth-generation computer that will hopefully provide solutions to a number of social and economic "bottlenecks" that presently plague Japan and other countries.

However, although the project was officially kicked off about seven months ago at an international meeting in Tokyo [CW, Nov. 9] — which included representatives from 38 U.S. companies — no U.S. firm has yet decided to join the Japanese in the quest for an all-powerful computer. In fact, a number of people at a recent conference here sponsored by Enterprise Information Systems, Inc. (EIS) were extremely skeptical that such a machine could actually be developed.

Although the so-called fifth-generation computer is still very much a blue-sky concept, the Japanese are pouring a great deal of time, resources and money into research that may not prove worthwhile. For instance, during the first three years, more than \$44 million will be spent on fifth-generation research, according to the Ministry of International Trade & Industry (MITI), an organization formed by both government and industry to oversee the project's research and development.

Reasons Concern Survival

The country has its reasons for devoting so much time and money to a project that might not be successful. Basically, these reasons concern survival and the future of mankind, according to Shohai Kurita, president of Computerworld Japan, Inc. and chief coordinator of the project's technical research working group.

Speaking at the EIS conference, Kurita offered a brief overview of exactly what a fifth-generation computer is and how it might operate. He preferred to focus heavily on what current problems it might solve and how it could

be used to improve society. It was reportedly the first time that a meeting on the fifth-generation computer has been held in the U.S.

Japan's version of a fifth-generation computer is modularly designed and heavily dependent on artificial intelligence. It is basically a problem-solving and inference machine that can make use of numerical as well as nonnumerical data to assist in decision making.

Profits Last on List

While a number of highly competitive Japanese firms are involved in the fifth-generation project — including Nippon Electric Co., Ltd., Sharp Corp. and Matsushita Electric Industrial Co. — profits are reportedly the last thing the Japanese have in mind. Belying this is the fact that the Japanese government supports 35% of the cost of the project and is inviting corporations worldwide to join in the research.

Rather, Japan's reasons are purely social, Kurita said. While the country is making great strides in technology, it has a variety of societal and economic bottlenecks that threaten to hold back its progress. First, Japan is bogged down by such low-productivity fields as agriculture, forestry, fishery and government services and distribution. It is also not fully self-sufficient in its food, energy or natural resources, Kurita pointed out.

One thing is certain: To succeed in its quest, Japan will need U.S. involvement, particularly in the area of artificial intelligence, which Kurita said is about 15 years ahead of research in Japan.

However, there are roadblocks. For one, U.S. companies are not used to working on projects that may or may not produce a final product 10 years down the road. In addition, there is currently a great deal of resentment exhibited toward the Japanese in regards to international trade and technological achievement.

Finally, there is the technology itself, which is more of a dream than a reality.

"The hardware is there, but the software elements and the human user elements are not," David Britton, president of Britton-Lee, Inc., a company involved in artificial intelligence and intelligent data base systems, said.

"We will have to wait a while before you can pull it all together and see a profit," he said.



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N.Y. DP Shops Not Hit By Recession: Survey

By Bob Johnson

CW New York Bureau

NEW YORK — There is very little DP belt-tightening taking place in the New York metropolitan area.

Although the country's economic recession is taking its toll industry-wide, a *Computerworld* poll of New York DP installations revealed that most shops are healthy and that users are conducting business as usual.

One respondent was particularly optimistic. Ralph Cashell, assistant director of management information systems (MIS) for Group W Cable, Inc. here, explained that the home entertainment business prospers in this type of economic climate because people tend to stay at home and use services such as CATV. "Our shop will be doubling in size. We are planning to make significant purchases in both hardware and software," he said.

Cashell even went so far as to predict that the growth of Group W's computer operations will double again next year. "We are in a growth industry that will grow whether there is a recession or not." The DP'er added that he is personally in an interesting situation because of the estimated boom in both the computer area and the CATV business.

Another positive response came from a DP manager at Jordache Enterprises, Inc. Rather than being hurt by the recession, Ira Osder's group recently went from an IBM System/34 to an IBM 4331 CPU so that it could handle an increased work load. In addition to this, Osder just added three people to his staff. "We don't feel any pressure from this recession. We are growing fast," he said.

Alfonso Izzi, director of DP at New York City's Financial Information Services Agency (Fisa), had a somewhat different view of the economic situation facing DPers. Although admitting the existence of a recession, Izzi noted that there is still a great demand for DP talent. "The problem I've been facing is holding on to

good people. We haven't had to cut back on people, but it seems that the good people are very picky," he said. He suggested that the economic atmosphere may be keeping the best talent in current jobs.

As far as hardware is concerned, Izzi said that Fisa was taking a "common-sense" approach to the recession. Rather than have a large capital outlay, Izzi said he is looking into measures that are more cost-effective such as lease payment plans and using established hardware. "With some of our equipment, like CRTs, we're riding with the older equipment instead of buying new ones," he said.

Operating As Usual

Most of the DPers questioned revealed that they are in neither a cut-back, nor a growth situation, but are operating as usual. Nelson Kaye, director of DP for Bonwit Teller here, noted that his department is taking a hard look at budgeting in terms of future DP growth. "We try to balance projections and growth in terms of the economy," Kaye said, adding that hiring new DP personnel is now examined more closely.

A vice-president of DP at a major bank here said that his expenditures in the computer area are on the rise. Pointing out that the banking industry is heavily involved in telecommunications, he said he felt that this commitment required more hardware, software and personnel.

Although the vice-president revealed that spending would go up, he tries to counter the increases in hardware and software by buying the most reliable products. He explained, "A good piece of hardware pays for itself in the long run, not only in functionality but in the service behind it. And, with that in mind, good software makes the job easier." Personnel was a big expense item for this manager. He said that technicians in telecommunications are so scarce that the pay is premium.

Siggraph '82 DP Conference Scheduled for Boston, July 26-30

CHICAGO — General computer graphics, animation, business graphics and computer-aided design and manufacturing are four areas that will be the primary focus of Siggraph '82, the Association for Computing Machinery's ninth conference on computer graphics, to be held in Boston on July 26-30.

A total of 24 one- and two-day courses will be held during the first two days of the five-day conference, consisting of both introductory-level tutorials and advanced special-interest seminars. In addition, the conference reportedly will present state-of-the-art technical seminars; a full-scale equipment exhibition, spotlighting hardware and software of more than 140 vendors; film and videotape shows highlighting the latest in computer graphics tech-

niques; computer-generated artwork; and in-depth vendor presentations.

Siggraph '82 is being held in cooperation with the IEEE Technical Committee on Computer Graphics, Eurographics, Harvard Graphics Week and the Summer Institute of Media Arts, he added.

Course registration fees are: \$195 for a two-day course or two single-day courses and \$130 for one single-day course. For students, the fees are: \$75 for two days and \$50 for one day. The late charge, for those registration applications postmarked after June 11, is \$75. All registrations include the \$10 fee for entrance to the exhibition floor, the spokesman said. Additional information can be obtained from Siggraph's Convention Services Department, 111 E. Wacker Drive, Chicago, Ill. 60601.

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Human Race Predicted to Die In Favor of 'Living' Robots

By Marguerite Zientara
CW Staff

MINNEAPOLIS — If the idea of marrying a robot strikes you as odd, consider the prediction that the human race will eventually die out completely in favor of automatons.

"Tied to the microprocessor, tied to the smart chip, tied to the ecology of 256K chips on up through the early stages of artificial intelligence [AI], we have started a whole new nonbiological life sequence on earth," said Arthur Harkins, director of the graduate program in futures research at the University of Minnesota.

"The nonbiological life sequence is analogous in some respects to the support system that Mother Nature provides for us with the biological life sequence," he noted. "For example, microprocessor-based motion systems can return mobility to the paralyzed."

"Microprocessors are being produced by the billions every year, and they're going into everything from toasters to people," he added. "Eventually, they will make houses semiliving organisms," he forecast.

"My guess, personally, is that we are creating our own replacements and the biochip is going to be the key to that: a semiliving, molecular-size neuron-equivalent circuitry that theoretically can make the human cranium room enough for, say, four to five times the present nervous system capacity," he stated.

The human race will gradually become a cyborg phenomenon (a bio-

logical system with a nonbiological implant, like a tooth filling) "in which the best of the AI systems and artificial organs will be implanted and buttressed by genetic engineering," Harkins predicted.

"We gradually will move in thousands upon thousands of different directions as a modified species," he continued, "but what will give us our enhanced longevity and our greater protection against environmental glitching — including radiation, water contamination or the absence of water and food — will be the movement from a biological species into an ecology of nonbiological species."

Can a nonbiological system be considered as living? "Yes, if it reproduces itself," Harkins said.

Can a nonbiological entity die? "It depends on where it's located, if you kill it all at once," he explained. "In other words, if my brain or your brain in 20 years is electronic in nature, we can transmit the contents of the brain electronically to any receiving station within a range on the order of light-years."

"So you or I might destroy our present brain cells, say in 2002, but the content of those brain cells would already have been transmitted to another receiver elsewhere," he explained. Does the thought of such a seemingly sterile future disturb a futurist? "No. What disturbs me is humans dying. What disturbs me is children who never get the chance to learn," Harkins concluded.

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With Software for Human Needs

Marry a Robot? Futurist Says Yes by Year 2000

By Marguerite Zientara
CW Staff

MINNEAPOLIS — By the year 2000 people will be "marrying" robots as surrogate human beings.

The first beneficiaries of such human/robot interfaces will be "burn victims, the elderly, the very lonely or remote or people in prison," suggested Arthur Harkins, director of the graduate program in futures research here at the University of Minnesota.

"The great bulk of human relationships are formulated on a ritualistic basis, which is to say that most humans, in their relationships with wives or lovers, expect a kind of metronomic precision of expected behavior and expected responses to occur over time," Harkins said in a recent interview.

Software for Human Needs

While not all people are alike, he noted, many expect "breakfast, lunch and dinner to be ready at a certain time, sexual acts to be performed at certain times or in certain ways, the house to be a certain way, the vacation to be a certain way and the children to be treated a certain way," he observed.

With computer-based "primitives," Harkins theorized, "it seems imminently possible to program software to meet those types of needs. When you add voice recognition, voice synthesis and at least limited mobility, you don't even need artificial intelligence [AI] to reach a plateau of performance acceptability for a lot of human beings."

These unions would not be legal marriages, Harkins emphasized, noting, "That's not going to be any more possible than marrying your boat."

"But when we do get AI in the late '90s or early 21st century, which will reduce costs and size," he continued, "we should be able to have humans paired off with machines in such a way that the comparison between their two capabilities [will] allow us, in some cases, to define them as equal."

When that happens, "legal bonding" will occur between humans and robots, Harkins forecast. "The 'mar-

Aug. Meet to Eye Information Systems

LOS ANGELES — The National Conference on Data Base Information Systems will be held here Aug. 23-25 under the sponsorship of University of California at Los Angeles (UCLA) Extension.

Emphasis reportedly will be on programmatic approaches to information management, as well as implementation and application of data base management systems. The conference, which will be held at The Ambassador Hotel in Los Angeles, is being expanded this year to emphasize information management.

The registration fee is \$595. More information may be obtained by contacting National Conference on Data Base Information Management Systems, P.O. Box 24901, Department K, UCLA Extension, Los Angeles, Calif. 90024.

riage' need not conform to the standard Christian approach of 'for a lifetime.' It may be for a weekend, for a day, for a year, until the burn scars are healed or until the personality retrieves itself from its depths," he said.

Supposing robots can be programmed with pleasing personalities or a temper, a sense of humor or a musical talent, will their companionability extend to sexual liaisons?

Yes, according to Harkins. "The Japanese have already developed all kinds of mechanical substitutes for human sexual organs, which are implanted in a robot and can be embellished with heat and other types of

human-like characteristics," he reported. In addition, it will become more and more difficult to physically distinguish robots from humans, Harkins predicted. "The metal or fiber or carbon filament [of which robots will be made] will be concealed by a decorative outer covering, which could be clothing, fur or an artificial skin with the warmth and texture of healthy human skin," he said.

The advent of AI may, however, throw a spanner in the works for humans who expect to pick and choose among robots as mates. "A fundamental component of AI is perceptive regression, which leads to self-awareness," Harkins explained. "A

self-aware computer with certain types of taste, so to speak, arrived at by heuristic add-ons to the previous programming, might say, 'I don't want to be married to that person, but rather to this person.'"

What about marriage as the sacramental joining of two people "in the eyes of God?" "The theologians are basically unwilling to deal with any of this," Harkins said.

"Furthermore, theologians are so anthropomorphic — assuming their God is in the shape of a human — that when you talk about machines that think, which are not in the shape of humans, they just don't know how to deal with it," he said.

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Data Base of Texts on Jewish Culture Available

DETROIT — Scholars of Jewish culture who work with texts that are hundreds of years old can now draw on the resources of modern technology.

The Reponsa Project, which began at Bar-Ilan University in a Tel Aviv suburb, offers an extensive data base of texts on Jewish life going back to the eighth century.

Israeli students with backgrounds in both computer science and rabbinical studies transcribe, index and enter the texts into the university's IBM 370/168 mainframe. Printouts are provided in Hebrew and many of the texts are the records of questions posed to rabbis or rabbinical courts over the centuries.

"The project started [in Israel] about

nine years ago under a grant from the National Endowment for the Humanities and various universities in Israel," said Dr. Irving Rosenbaum, executive vice-president and director of the project here at the Institute for Computers in Jewish Life.

Bar-Ilan has been using an IBM 370/168 with PL/I language since the project originated, Rosenbaum said.

The purpose of the project was to "apply computer technology to ancient traditions and teachings of Judaism," he explained. Another motive for the project was to "create a data base to be easily accessed to provide information on Jewish life, law and experience."

The institute, which administers

standardized tests on Jewish education, became involved in the project three years ago out of a mutual interest in computers, Rosenbaum said.

Currently, the institute is the only place in the U.S. for scholars to gain access to Bar-Ilan's data base.

According to Rosenbaum, six other schools including Yale Law School, the University of Michigan and the Jewish Theological Seminary have expressed interest in getting terminals to access the data base. The institute is currently looking for terminals.

Requests for information are not strictly limited to Jewish scholars, Rosenbaum said. Information on glassblowing, law, architecture in France, the role of the policeman in

Jewish life, the withdrawal of life support systems, abortion, medicinal use of folk remedies, women's rights, euthanasia and ship building are all included in Reponsa's data base.

Mostly in Hebrew

Most of the texts are in Hebrew, Rosenbaum explained. However, texts written in Aramaic or Ladino — a mixture of Hebrew and Spanish — are also available. Non-Hebrew texts are transcribed and entered into the system with an elaborate index reference, he said.

Texts must be indexed by certain words or groups of words as well as by topic, Rosenbaum said. "Hebrew is a highly inflected language," he said. A word like "steal" has only a few English inflections — stealing, stole, stolen, for example.

In Hebrew, the same word can appear 297 different ways, he said. "It's a monumental task to search for every variation," Rosenbaum said. The system currently uses 600M bytes of memory, but project leaders are planning to expand peripheral memory in order to add all modern Jewish literature, Rosenbaum continued.

"It's a massive project," he said, "but we're going to do it."

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In Search of the 'Typical' Rapist

Memphis Police DP Study Examines Rape Cases

By Susan Blakeney
CW Staff

MEMPHIS, Tenn. — Despite repeated computer-based analyses, a computer-generated study on 2,583 rapes here yielded no conclusive police leads regarding the "typical" rape case.

The Extended Rape Investigation by Case Analysis (Erica) study was conducted by the Memphis Police Department in conjunction with Southern Illinois University in Carbondale. Its purpose was to identify the typical rapist, the typical rape victim and the most likely times and places for rapes to occur. It was thought that this information would help police catch rapists and prevent future rapes. According to Patrolman Jeff Larkin, manager of the police planning and research section, Memphis is one of the top 10 cities in the country in terms of reported cases of rape.

"We wanted to get at the nature and

Customs Targets DP Export Crime

WASHINGTON, D.C. — Preventing illegal exports of high-technology products is a top priority for the U.S. Customs Office, on a par with intercepting narcotics smuggled into the U.S., according to customs Commissioner William Von Raab.

Last month 45% of the seizures made by customs officials were computer and computer-related equipment, Von Raab reported. In the past six months, under its special program called Operation Exodus, the customs office has seized a total of \$20 million worth of illegal exports to the Soviet Union, a large part of which was computer-related equipment, he said.

The customs office is putting a tremendous amount of resources into Operation Exodus in the form of assigning more inspectors and investigators to tracking firms and individuals suspected of smuggling high-technology goods. Moreover, customs is making much more detailed and frequent inspections of outgoing goods, Von Raab maintained [CW, March 1].

"We think the manufacturing community has become more aware of the problem, so we've seen some lessening of illegal exports by people who didn't know they were doing it," he noted. "Manufacturers should be very careful about the people they do business with, asking who is the ultimate user and what are the applications for the goods."

Manufacturers should become immediately suspicious if the customer is "some fly-by-night operation out of some storefront, shipping very sophisticated equipment from, say, The Netherlands to another company they've never heard of," he said.

While customs crackdowns are on the upturn, with several indictments and convictions made in recent months, markups of 200% to 300% at the middleman level still seem to be attractive enough for illegal exporters.

the scope of the problem," Larkin explained. "We took a task-force approach. We wanted to see if we could develop a profile of the typical suspect ... and find out if we could schedule our man power better to deal with the problem."

The rapes reported in the study happened between Jan. 1, 1974 and Dec. 31, 1979. The cases were hand sorted and eventually keyed into an IBM 370 mainframe, using McGraw Hill Book Co.'s Statistical Package for Social Sciences to form the data base for the study.

While the compilation of evidence drawn from these attacks did not produce the statistics originally

sought by the police department, it did show:

- Sixty-two percent of the victims were attacked by strangers.
- Seventy-four percent of the victims were under 25.
- The greatest number of rapes occurred in the downtown area.
- In 42% of the cases, the police had identified a suspect within 24 hours.
- In most cases, rape victims were accosted by members of their own race.

The study took about 16 months to complete and cost the department about \$22,000, but Larkin does not consider the time or money wasted. "We identified the areas rapes were

most likely to occur and times they were most likely to occur at ... so we could target a public education program," he said. Larkin said the study also helped to dispell some commonly held beliefs about rape, such as the contention that they tend to happen near bars or recreation areas. "Only 4% occurred near bars or recreation establishments," he cited.

Larkin said the research group has made recommendations to expand the Erica study and integrate it into the department's data base. He concluded, "I'd like to see it extended into robbery and auto theft, but this would require a lot of groundwork first."

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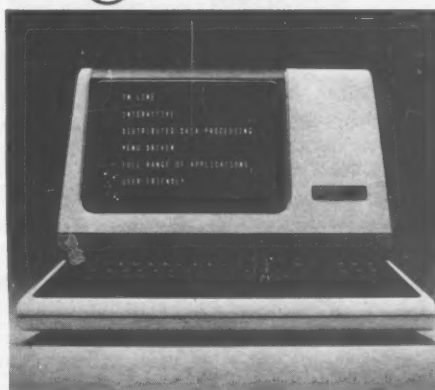
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At ASM Conference

Don't Lose Sight of Management Aspects: Exec

By Brad Schultz

CW New York Bureau
KANSAS CITY, Mo. — DP managers have several tigers by the tail, consultant George Glaser told the annual Association for Systems Management (ASM) conference here recently.

In the conference's keynote address, Glaser called the tigers in his metaphor "the promises of information systems" and said the tail is "our dedication to the exploitation of the technology that makes such systems pos-

sible."

Glaser is a past president of the American Federation of Information Processing Societies, Inc. (Afips), the umbrella organization for computing professional societies that sponsors each year's National Computer Conference. He currently serves as the U.S. delegate to the International Federation of Information Processing Societies.

Glaser told ASM attendees that while demand is increasing for qualified DP professionals, little progress

has been made over the past decade in developing such people. The problem partly stems from what universities teach people headed for computing careers, he explained.

"Medical schools teach the practice of medicine and law schools teach the practice of law," he noted. "But how many universities, even those well known for their computer science programs, teach the practice of computing? Far too few, in my opinion."

Glaser observed that a number of universities have established DP programs to teach the practice of computing as separate from computer science programs that develop researchers and teach theories of computation. Despite this slow-developing trend, he told the conference of DP managers: "It looks like you're going to have to grow your own [staff of DP professionals]."

According to the Los Altos, Calif.-based consultant, DP managers with tigers by the tail have lost sight of the management aspects of practical computing. Given the nation's poor capacity for training DPs, DP managers should strive to keep their most talented subordinates excited about working, he told the conference.

In other words, the present state of the DP job market compels DP managers, as never before, to exercise skills in developing and motivating the people under them. Glaser indicated that information systems, and the environments served by such systems, have grown so complex that some DP departments are literally becoming unmanageable.

The advent of office-oriented personal computers allows end users to reduce or qualitatively change their dependence on DP departments, Glaser observed.

While DP managers try to

hold their grips on tiger tails, he suggested, end users are romping with a new breed of cat that immediately meets their needs for information storage, manipulation and display and that is far less expensive to feed and shelter.

DP managers should approach their growing challenges as managers by asking themselves how systems plans and projects would change if they were their organizations' chief executives, he advised.

A DP manager who poses that question and concludes that no change would ensue can have some confidence that he is at least working on the right problems, Glaser stated. If the answer is that systems plans and projects would change, "then it's obvious what you must do," he told the assembled DP managers.

The former Afips president also said DP managers are

dealing with unrealistic expectations that fully integrated information systems — capable of efficiently passing information among different forms and brands of equipment — can be implemented cost-effectively at the present time. "I believe that today we are only marginally capable of building such systems," he declared.

"The skills required ... to achieve a proper balance between practicality and complexity severely tax our current levels of technical and managerial competence," he explained.

"Taming tigers is a challenging undertaking," Glaser warned. "Holding on tighter to a tiger's tail won't work."

"It may prevent you from being devoured as long as your strength holds out," Glaser concluded, "but the odds are that the tiger will outlast you."

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UCC Sponsors Software Meet

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Further details on the upcoming event are available from UCC at UCC Tower, Exchange Park, Dallas, Texas 75235.



Lawyers Seen Needing DP Specialists' Aid

By Brad Schultz

CW New York Bureau
KANSAS CITY, Mo. — Attorneys have become "information managers" who need DP specialists to advise on litigation and computers to monitor cases in progress.

This is what two attorneys said here at a recent Association for Systems Management (ASM) conference. They noted that documentary evidence in civil suits, not just suits that focus on computer usage, commonly comes from a computer and requires interpretation by a computing expert.

According to Donald E. King and Kenneth J. Moran, attorneys with the Richmond, Va. law firm of McGuire, Woods & Battle, the "discovery" phase of a civil suit features an exchange of pertinent records among legal counsels for both parties.

Federal Rule Change

Moran said a 1970 change in federal rules of civil procedure compels one side in a suit to furnish the other side with virtually any records the other side requests during this phase.

Over the past 12 years, in other words, attorneys have

requested far more business records in preparation for trial at a time when business records became far more extensively stored in computers. Meanwhile, the number of civil suits resulting in awards of at least \$1 million to plaintiffs has risen sharply. Moran added, so civil litigation is increasingly a high-stakes game played with computers.

The nation's first \$1 million verdict was in 1962. Moran said there were 20 verdicts of \$1 million or more during the period 1962 to 1969 and 298 such verdicts between 1970 and 1979.

The DP professionals who assist attorneys in civil litigation are not necessarily asked to testify. In suits between companies, it is common for a DP employee of the plaintiff to assist the plaintiff's counsel as employees of the defendant are interrogated during discovery, King said.

In this capacity, the DPer on the plaintiff's payroll tells the plaintiff's counsel when, for example, a field on a certain data record was probably not designed to do what the defendant's employees have said it does. By examining the format of the defendant's business records, the

DPer can tell his company's attorney when data structures corresponding to the format imply the existence of other data important to the case, King told the session.

A Case Unfolds

For example, a company accused of bribing certain customers to keep them from buying products of another company might be asked to furnish billing records during the discovery phase of a suit launched by the latter company. A DP employee of the latter company (the plaintiff) might inform its

counsel that data structures corresponding to the format of the records under examination suggest the existence of another set of billing records, King explained.

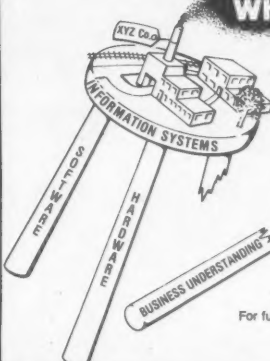
The plaintiff's counsel might then ask the defendant to furnish the record set that appears to exist. By comparing the two sets of billing records, the attorney could then see that certain customers were not billed at the same rates as other customers on similar orders, indicating "kickbacks" in the form of special discounts.

Besides using their clients'

DP employees to prepare for particular law suits, attorneys have taken to implementing their own "litigation support systems," Moran told the ASM conference session. Such systems are especially helpful to the general counsel of large companies, he declared.

A company's board of directors may routinely ask the corporate general counsel to state how many cases the company has pending, as well as the damages (in dollars) sought and the likelihood of winning in each action, Moran said.

What's Right With This Picture?



Too often information systems leave management and operations without a leg to stand on. Information systems based on computer technology rather than on an understanding of the business functions don't allow management to adapt to or take advantage of a changing business environment. Business functions are complex and are thought to be difficult to translate into computer system requirements. They don't have to be...

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Systems Development Approach

Structured Analysis Said to Cut Security Risks

By Brad Schultz

CW New York Bureau

KANSAS CITY, Mo. — Data security risks can be minimized with a structured analysis approach to systems development, a Yourdon, Inc. executive told the Association for Systems Management (ASM) conference here recently.

Structured analysis sprang from an aesthetic movement in computer science circles, led by the Dutch programming methodologist Edsger Dijkstra, and, over the past decade, was popularized in the American DP community by Yourdon and other consulting houses.

John F. Palmer, Yourdon's director

of structured analysis services, told an ASM conference session that the top management in U.S. companies typically assumes DPs have built "well-controlled" systems when they have not.

'Scant Rewards' for DPs

DP professionals have had little reason to build well-controlled systems, Palmer indicated, explaining that by nature, DPs are more enthusiastic about utilizing systems than preventing others from doing the same. Moreover, systems development environments commonly offer scant rewards to programmers who incorporate data security fea-

tures in emerging software and offer few penalties to programmers who neglect the security aspect of systems design.

Using a frequently quoted computer abuse statistic, Palmer said 80% to 90% of systems security breaches are estimated to pass unnoticed. A number of the nation's larger companies have created the job of data security officer, he told the session, adding that graduates of computer science or DP programs who supplement their technical expertise with training in law or criminology will find "big bucks to be made in that area."

Yourdon itself has experienced a computer security breach, Palmer de-

clared. A data entry operator reportedly breached the Bell Laboratories Unix system under which the New York-based consulting company stored such sensitive information as the salaries of all its employees. This Yourdon employee then advised some of his co-workers that they were not earning as much as others with similar seniority in equivalent jobs, Palmer maintained.

When Yourdon managers realized their employees were complaining about salaries because they knew what other employees were earning, the managers suspected a breach of the Unix system and laid a trap for the culprit by storing fictitious electronic mail in the system, indicating that a major corporate restructuring was imminent, Palmer stated.

The data entry operator accessed the fictitious information and began spreading the word so conspicuously that Yourdon's management learned the individual's identity, he said.

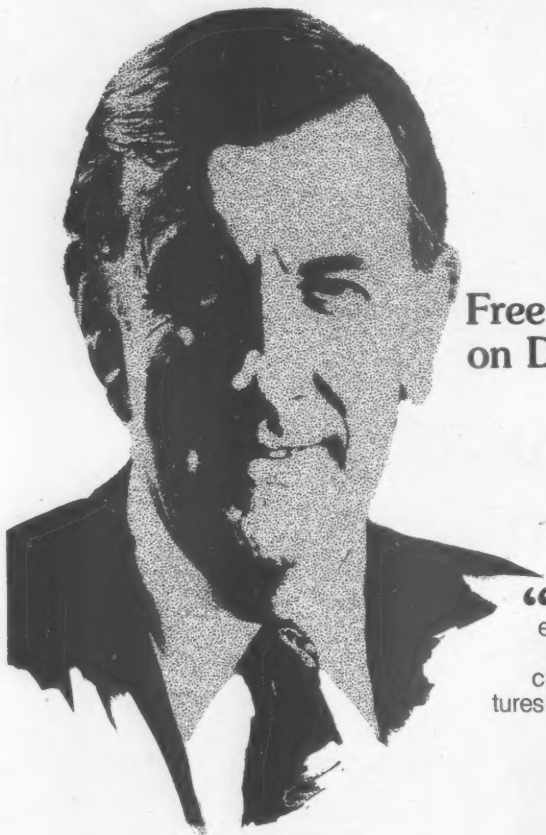
'To Minimize Likelihood'

To minimize the likelihood of such breaches occurring, systems developers should employ structured analysis in order to pinpoint areas of vulnerability, the Yourdon executive recommended. With structured analysis, he explained, systems development has three basic steps: defining the "essence" of the system, selecting the "incarnation" of the system and, finally, building the system.

The system's essence can be depicted in a simple flow diagram featuring circles and arrows that represent what the system would do for the organization, Palmer said. To translate this model of the system's essence into a model of incarnation, developers must deal with such limitations as capability, capacity, cost and fallibility of actual computing products and services. The system's incarnation is thus the physical implementation and what resources it consumes.

The essence model of a projected system shows who can access or manipulate what data, Palmer indicated, and therefore suggests who in the organization can, theoretically, abuse what data. An appropriate measure for preventing such abuse might be establishing an authorization requirement, whereby the employee who could perform a certain kind of abuse must notify another employee, typically the individual's immediate superior, before getting a chance to do the abusive act.

A "suspicious activities data store" could be featured in the system, Palmer added. This would log all systems activities that might have entailed abuse of sensitive information, allowing a list of suspects to be generated immediately when abuses are detected.



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At Office Systems Meet

Bass Calls Baseband vs. Broadband Battle 'Passe'

By Bruce Hoard
CW Staff

MIAMI — The once-raging controversy over the relative merits of baseband vs. broadband local-area networking technologies is becoming "somewhat passe," according to Charlie Bass, vice-president and co-founder of the local-area network vendor, Ungermann-Bass, Inc. Speaking at the International Data Corp. Strategies for Office Systems conference here recently, Bass said there are strong arguments to be made for both of the much ballyhooed networking schemes and predicted that neither will land a knock-out blow to the other.

He noted that in the unlikely event one of the contenders for office communications dominance were to fail totally, it would be the result of unforeseen market forces rather than inferior technology.

False Focus on Technology

According to Bass, too much emphasis has been put on technology, a situation the vice-president likened to the excessive attention paid to cycle time during the development of modern computers. Since the battle has abated, users are turning their attention to questions of applications and performance, he said, adding that the right local network for one

company may be the wrong one for another.

Bass cited three groups as the primary players in the local-area network game: computer systems manufacturers, components systems manufacturers and communications systems manufacturers.

He referred to private branch exchange (PBX) makers as peripheral participants, noting that they have difficulty conveying video transmissions. However, PBX have the advantage of a ubiquitous wiring plant in the form of telephone lines, he pointed out.

Xerox Corp., IBM, Wang Laboratories, Inc., Digital Equipment Corp.

and Datapoint Corp. are firms Bass categorized as computer systems manufacturers that must contend with intervendor connectivity problems.

Confusion About Intentions

In addition, there has been a great deal of confusion about this manufacturing group's true intentions toward local-area networks, according to Bass. Although local networks are a "key ingredient" in the overall marketing strategies of these vendors, sales of the devices that attach to those networks are really the driving force behind their planning, he claimed. "They're not individually interested in providing a local network," Bass said.

Components systems manufacturers make CATV components that can be used as building blocks for local network construction, the Ungermann-Bass cofounder explained. Members of this group let their customers deal with architectural problems, according to Bass.

Firms he named as examples of this classification include Jerrold Corp.; Intel Corp.; Interlan, Inc.; and 3 Com Corp. The inclusion of Intel in that group is significant because the company is one of multiple semiconductor makers working on large-scale integration and very large-scale integration interface chips, he explained.

Communications systems manufacturers as described by Bass offer complete multivendor systems for end users, concentrating more on software products than hardware. Companies in this category are Ungermann-Bass; Sytek, Inc.; 3M Co.; General Electric Co.; and Amdax Corp., he said.

Three 'Crude' Categories

The vice-president also categorized local networks into three admittedly "crude" groupings based on transmission speeds. Users at the 1M bit/sec level include Corvus Systems, Inc., which is interconnecting low-cost terminals and personal computers. These users are more concerned with low prices than high performance, Bass said.

On the high end and with running transmission speeds of up to 50M bit/sec are companies like Nestar Systems, Inc., which ties together mainframe computers for \$40,000 per interface. Those firms are primarily interested in high performance, he said.

The mid-range group is by far the largest and includes Xerox, Wang and Datapoint with its Arcnet, he said. Common transmission speeds are 10M bit/sec and there is nearly equal emphasis on both price and performance, according to Bass.

He lauded the International Standards Organization's emerging Opens Systems Interconnect architecture, noting it will provide "a frame of reference, a common dialogue" for the communications industry. On the negative side, Bass said it is "somewhat rigid" and may pose problems for established communications systems that are not compatible with the standard.

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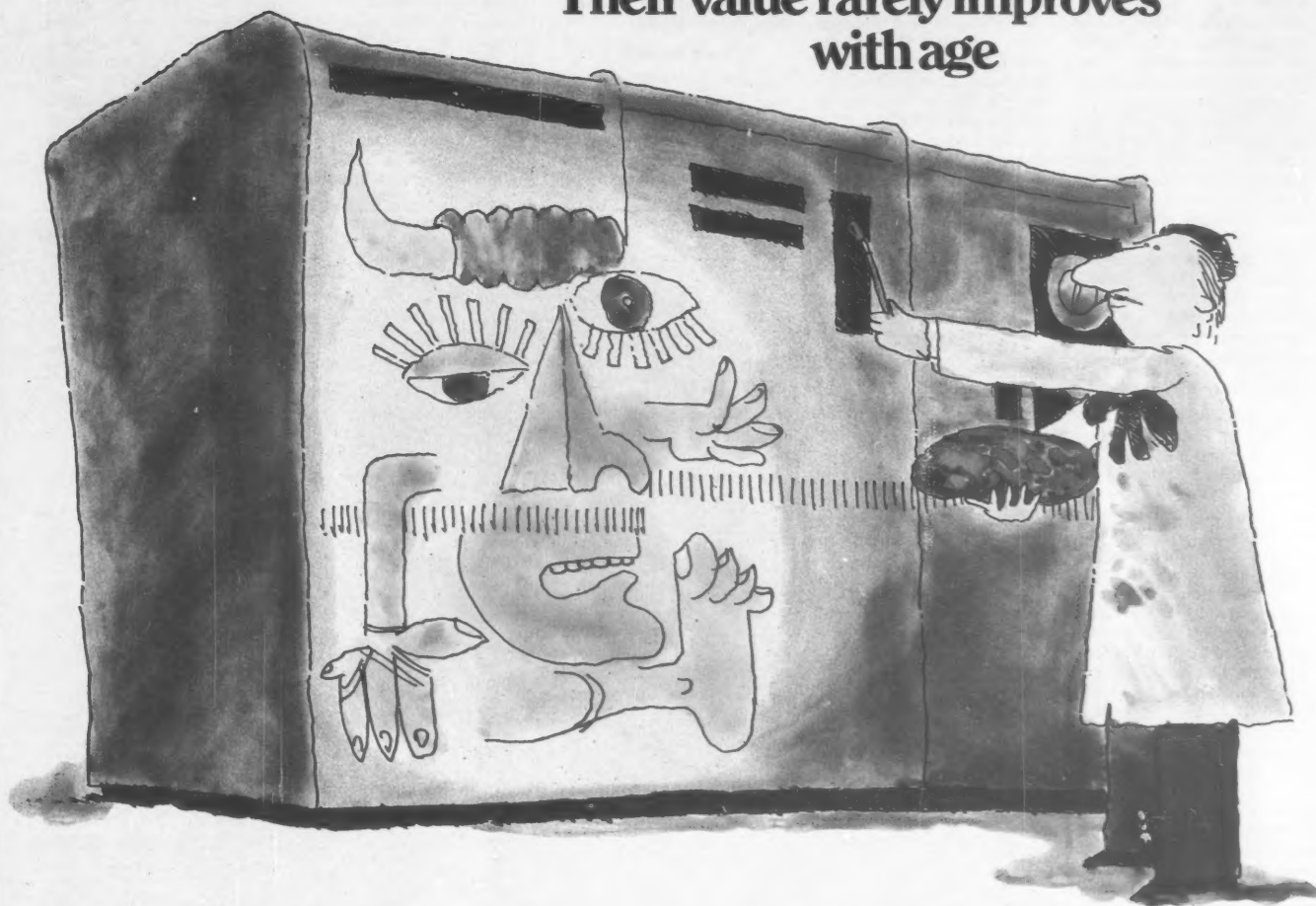
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Relational DBMS Lets Users Chart Own Course

LOS ANGELES — One DP center to handle standard accounting applications was only the beginning for Todd Pacific Shipyards Corp. here, which recently installed its second technical data center for word processing, computer-aided design and manufacturing.

The underlying tool in the technical data center is a relational data base management system (DBMS) that allows end users to write their own programs, according to a firm spokesman.

Both the Los Angeles and Seattle shipyards handle Navy contracts, building new ships and repairing commercial and Navy vessels, he said.

Repairing the Love Boat

The company currently has a contract to build a total of 42 guided missile destroyers, according to Don Ferguson, manager of systems and procedures. Todd's commercial customers include the *Princess* cruise boat, better known for its role on network television as the *Love Boat*, he noted.

The technical data center runs Henco Software, Inc.'s Info DBMS on a Prime Computer, Inc. Model 750 supermini. The Vision project management system from Systonics, Inc. also runs under the DBMS.

An interface program was developed that guides users in extracting resource files from Vision and converting them into Info files for easier manipulation. With three basic commands — Vision, Infoface and Info — users can go from one program to another, the spokesman said.

The system provides the format for inputting data, performs calculations and generates required reports. "For general use, you can

jump in and an hour later you have a program that would take you a couple of days in Fortran," said naval architect Judi Orr.

An example of a program coming directly from an end user is one that Orr wrote to determine how much a vessel under construction weighs, where the weight is located and how the ship will sit in the water, a Todd spokesman said.

"The main thing is that she developed the program herself and produced the report without going through the standard coding formats," the spokesman said.

Navy Reports

According to Ferguson, the word processing function of the DBMS is used to process work orders and reports for the Navy. The technical data center also interfaces with

the DP center's Honeywell Inc. Honeywell Level 64 mainframe and will interface with the newly delivered Honeywell DPS 7.

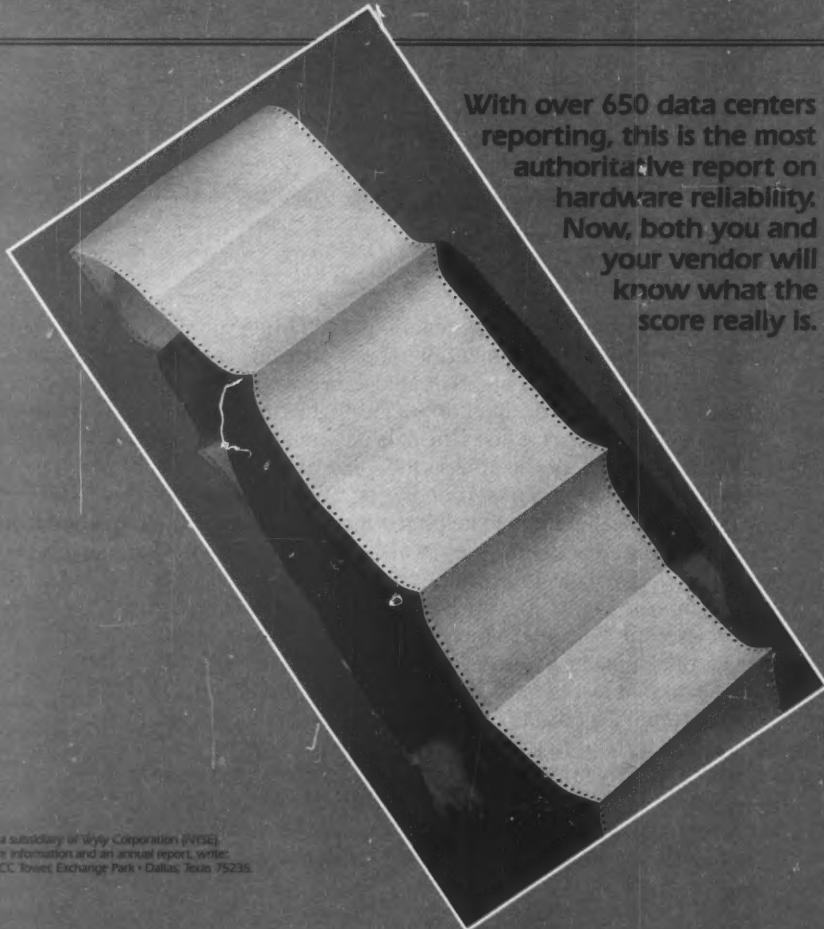
"One of the most important things we are doing is updating schedules in Vision," said Don Gazzola, chief planner in the production planning department at Todd. "We bring them into Info format because it is easier for our managers and produc-

tion people to look at and understand. We attend weekly production meetings and collect the physical progress on all jobs, then generate a report. With five people on the system, we're finding that almost triple our output in terms of the kinds of reports we used to generate by hand." The firm plans to install an Info DBMS in the Seattle shipyard in the near future.

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By End of Decade

DP, OA Seen Merging by Decade's End

By Susan Blakeney

CW Staff

NEW ORLEANS — Data processing and office automation will merge by the end of this decade and computing and communications will become "communications."

These predictions came from Dr. Howard Frank, president of Contel Informa-

tion Systems during a session on "Strategic Planning for the Integrated Information Environment of the '80s" at the International Communications Conference here recently.

Frank urged his audience to start thinking now about the office of the future and emphasized the importance of long-term preparation for in-

tegration with business planning as a whole. "Planning must be done," he stressed, "as opposed to fire fighting."

'Mission of the '80s'

According to Frank, the "mission" of the communications manager in the '80s includes plotting the company's strategic policies and beliefs. The firm's percep-

tion of future direction and reasons for doing business in a certain way are questions that must be answered now, he maintained.

Next, the forward-thinking communications person must conduct an internal and external environmental analysis.

At this point he must test the waters in the regulatory

environment, the economy and the existing technological arena. He must examine the structure of the organization, its strengths and weaknesses and chart a complete operational analysis.

Outlining Objectives

Objectives then should be outlined on a primary and secondary basis, he said. The manager should examine how the company distributes computing capabilities and methods for building a communications network to tie its computers together. The primary objective, according to Frank, is to develop a network architecture and an implementation plan. The next step involves developing "action plans," Frank said. This includes drawing up a calendar of specific plans to correct organizational weaknesses and developing a market plan and a facilities plan.

Also needed at this point is a financial forecast and an historical data base documenting all of the above plans since strategic planners in the corporate environment will be more receptive to plans that are well laid out, he said.

Strategic Planners

Strategic planners are the people to seek out in the organization, Frank maintained, describing them as the most qualified and receptive in the organizational framework.

Furthermore, Frank said the "strategic planners generally operate in a vacuum — they sit around looking for something to do. They are desperate to help; they're trying to justify their own existence. They will latch on to you."

A good strategic plan takes between six and 12 months to build and the best number for a strategic planning group is four to eight people, he said.

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Manager's Balancing Act Ends With Big Savings

By John Joss
Special to CW

FAIRFIELD, Calif. — In a time of tough, voter-mandated limitations on property tax revenues, convincing a county government to allocate new funds for the modernization of hardware and software for a property tax processing system is about as tough and go as a high-wire act.

But Roland Mace, Solano County property system manager, was able to do the balancing act, selling the conversion to the county supervisor and following through with an implementation that came in on schedule and produced significant savings to the county.

Mace is responsible for overseeing the processing of property tax data

on gross taxable property approaching \$6 billion. Located an hour's drive northeast of San Francisco, Solano County is almost 900 square miles with a population of 250,000. The county has 86,000 parcels of every form of assessable real property from unimproved farmland to high-technology industry.

About 20,000 parcels of property have to be reassessed annually.

Every system has its roots and evolution. Mace's was no exception. In the early '70s, the county was running a small, tape-oriented IBM System 360, which grew into a 370/135 running with Isam, which allowed on-line inquiry and batch updating.

In 1978 Isam was replaced with Cul-linane Database Corp.'s IDMS. But

on-line inquiry and batch updating remained because data management associated with property tax assessment was only one more application for the system, which was also running the county's payroll, personnel, accounts receivable and payable, purchasing and inventory control and welfare and criminal justice applications.

"We had to have our own dedicated machine in the assessor's office," Mace explained. "The work load and the timing on the 135 were making our department unresponsive."

Compounded with this problem was the Proposition 13 curve ball the legislature threw government agencies in 1978. "We spent several months debating, writing and just-

fying reports for non-DP county management," Mace recalled. The figures made sense and finally county management approved the new system.

Mace knew he wanted a supermini capable of permitting on-line inquiry through terminals. "After defining our needs, we looked at what Datapro [Research Corp.] said about several competitive machines with suitable specifications and performance. Then we sent out requests for proposals and got five to six answers." After a point-by-point competitive scoring, the choice was narrowed down to systems from Hewlett-Packard Co. and Data General Corp., which virtually tied in the ratings.

Mace and his team visited user sites for both systems and the group eventually selected the HP 3000/Series III with 1.5M bytes of main memory, four 120M-byte removable disks and two 1,600 bit/in. tape units, plus a 400 line/min HP 2608A printer and 15 2645 and 2626A terminals. The system cost \$350,000.

"We needed about three months to install the system. Then it took approximately one year to get our first big system implemented and installed in a difficult design process," Mace recalled.

The Model 135 DP group helped Mace convert the data base from Ebc-dic to the Ascii format required on the HP 3000. Once reformatted and loaded, the data base was in place to implement the new applications required by Proposition 13.

Serious Trouble

"By then I realized we were in serious trouble. There was no way I'd get a whole series of Cobol programs written from scratch. We had to cover unsecured and secured business and real property — that's four systems," Mace said.

Mace estimated he would need five man-years of Cobol programming to complete all of those systems. Figuring a loaded programmer cost of \$32,000 per year— or \$160,000 for the project— Mace realized he was beyond his budget. And time was running out for complying with Proposition 13 requirements.

A package seemed to be the right solution. Mace evaluated Insight, a \$7,500 package from Computing Capabilities Corp. of Mountain View, Calif. Insight provided a simple "fill-in-the-blanks" solution as an alternative to programming. It is based on a set of menu screens used to describe each on-line transaction.

By going the package route, Mace's system was implemented in three years at a cost savings of at least \$60,000.

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Product Specifics: The 2078 Display Station is built for flexibility, operating in bisynchronous as well as SNA/SDLC environments. It is built compactly to conserve space and even features a monitor that detaches for shelf placement. It is built to conserve energy, with efficiency features that allow the 2078 to operate on 58% less power while generating 41% less heat than its IBM equivalent. It weighs just 55 pounds, some 47% lighter than the IBM competition. And above all, the 2078 is built for people. The monitor is tiltable and the screen recessed. That screen, the keytops and all moldings are non-glare. The keyboard is movable for comfortable positioning.

The 2087 Matrix Printer also features SNA/SDLC protocol compatibility in addition to bisynchronous operation. It is both fast and quiet. A microprocessor-controlled print mechanism delivers high quality printouts at speeds up to 50% faster than the IBM equivalent. A bidirectional matrix print head seeks the shortest path to the next line, backwards and forwards, maximizing throughput. Acoustical engineering reduces noise levels, while a membrane switch panel, controls and LED indicators, all located on the front panel, provide the operator with local control and printer status.

The 2076 Remote Cluster Controller is a lightweight 30-pound package that accommodates up to eight printers and/or terminals in a bisynchronous environment. It measures a streamlined 6.5" high x 14" wide x 28" deep. While the 2076 can be located as far away as 4920 feet from its attachments, its dimensions allow for convenient placement just about anywhere, singly or stacked. Standard power-on, off-line and on-line diagnostics contribute to increased uptime.

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Tracks Data Communications Bugs

Net Helps Federal Express Deliver on Time

MEMPHIS, Tenn. — A network management system is helping the Federal Express Co. make sure its data communications network runs smoothly and keeps track of packages running the gamut from computer printouts to a gorilla.

The management system from Paradyne Corp. of Largo, Fla., was designed to unsnare any hitch in the communications network that handles the 160,000 packages moved daily by Federal Express.

When a package is shipped via Federal Express, the data is first received at one of three dispatch centers in Tennessee, New Jersey or California. Data about the package is transmitted to the data processing center here in Memphis where a printout is forwarded to the Federal Express station nearest the customer. All packages, with few exceptions, pass through the Memphis terminal's sorting facility and are then placed on board one of Federal Express' planes for delivery, Ancel Hankins, project manager for data engineering, said.

Federal Express ships a large number of electronic parts, contracts, blueprints, drawings and computer printouts. The company has a 70-pound weight limit on packages, he explained. However it did once agree to ship a live adult gorilla last year for the Memphis Zoo, he recalled.

Because the Federal Express network is so widespread, company officials

want to monitor, diagnose and repair problems from the company's central site here, according to Hankins.

In 1979, the company's data processing engineers began examining the need for remote diagnostic and restoral capabilities that would ensure smooth running for the data network, he said. Systems from 13 different vendors were examined before company officials decided on Paradyne's Analysis network management system.

The Analysis system includes a Texas Instruments, Inc. 990/10 minicomputer, a 10M-byte disk drive, a printer and three CRT terminals, Hankins

said. The system supports about 70 circuits and incorporates 4,800 and 9,600 bit/sec Paradyne modems with integral microprocessors, which give them diagnostic and restoral capabilities.

The data communications network, which logs, sorts and keeps track of packages, is composed of three networks. One is for dispatching and two are for message switching with approximately 3,500 terminals, he said. Located in East Memphis, the system consists of two IBM 3033s, a Model 3031 and 4341. An IBM 3081 is currently being installed. To operate the networks, Federal Express leases 190,000 miles of telephone lines and

has a phone bill of approximately \$1 million/mo, he added.

If a problem such as a phase jitter, low signal-to-noise relation on a line or trouble with a modem or terminal occurs, the Analysis system notifies operators who can check printouts to identify and pinpoint line problems. Hankins added that in critical areas a "hot spare" modem is available in case the primary modem goes down.

With a diagnostic microprocessor in each modem communicating with the central site controller over an out-of-band channel, the microprocessor can perform its function without interfering with data flow, Hankins said.

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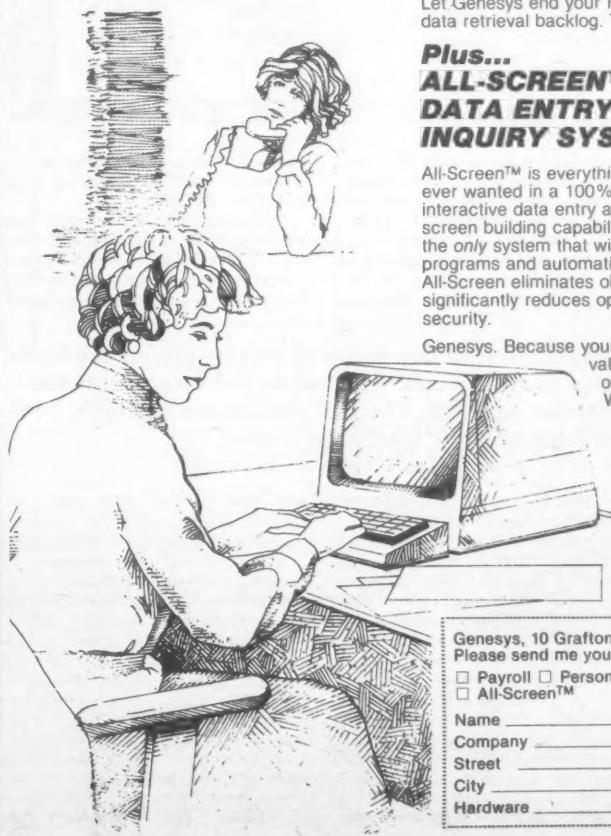
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Oracle Meet Set Aug. 23-25

MENLO PARK, Calif. — Relational Software, Inc. has announced that its First International Oracle Users Conference will be held Aug. 23-25 in San Francisco.

The conference will consist of general sessions and the presentation of papers by users of the Oracle relational data base management system. Representatives from more than 150 installations of Oracle in North America, Europe, Japan, Australia, Israel, South Africa and Korea are expected to be present, according to a spokesman.

Conference headquarters will be at the Hyatt Hotel on Union Square. The registration fee is \$430 until July 31. After this date, there is a late fee of \$50.

Further information and registration materials may be obtained by contacting Relational Software, Inc., 3000 Sand Hill Road, Menlo Park, Calif. 94025.

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In Less Than \$25,000 Group

New Small Systems Big on Power, Low on Cost

By Hillel Segal
Special to CW†

There were a few surprises and some outstanding cost/performance bargains among the computer entries priced under \$25,000.

Half of the 12 systems are based on the popular Zilog, Inc. Z80A and Digital Digital Research, Inc. CP/M. Several, like the Commodore Business Machines, Inc. CBM-8032 and IBM Personal Computer, offer graphics.

Operating systems varied widely on the field. CP/M was the most popular; Bell Laboratories, Inc.'s Unix-like operating systems were featured on two systems. Two others (Smoke Signal Broadcasting, Inc.'s and NEC Information Systems, Inc.'s) allowed multitasking. The operating system was transparent to the user on the Wang Laboratories, Inc. 2200SVP, IBM 5120 and Commodore CBM-8032.

The benchmark tests run on the systems included raw computing and diskette I/O speed plus typical three program examples. Of the latter, two are reported here: the scientific/engineering test and the accounts receivable test.

The scientific/engineering problem solves a system of linear equations with 50 variables and 50 unknowns. It uses the Gauss-Jordan method of elimination and runs without disk access.

The accounts receivable problem creates a file of 50 records having 10 fields each. The file is then updated randomly 10 times, giving sales and payment information. At the conclusion of the problem a report is printed with the updated billing data. The test requires considerable disk access, thus providing a more balanced performance assessment.

The computers were all tested in a version of Basic. Three used compilers — the NEC, Altos systems, Inc. and Dynabyte, Inc. The NEC Basic was unique in that it had many characteristics similar to Cobol; it also lacked square root and exponentiation functions.

In those systems that had both hard disk and floppy, all tests were run using the floppy disk except as noted.

Here are some of the highlights from the latest group of systems tested for ACU:

- SD Systems, Inc. SD-200. Performance was in the middle of the other systems we tested. It has a Z80A and S-100 bus with the CP/M operating system. The Phase One Systems, Inc. Oasis operating system is also offered. It is upgradable to five users and 96M bytes of hard disk. SD Systems supply some application programs. Like many systems, the documentation was poorly written and organized. Price as tested: \$12,300.

- NEC Astra 205. The performance on our benchmarks was about average if runtimes only are considered. The compiler seemed to make excessive use of the disk for intermediate storage, causing fairly slow overall compile-and-runtimes. The 205 employs an operating system that had been designed for larger NEC systems and offers capabilities like multitasking. Outstanding features in-

SCOREBOX

Benchmark Tests Of 25 Small Computers

SYSTEMS UP TO \$25,000

	C-1 Scientific Engineering Time (min)	C-3 Accounts Receivable Time (min)
Pertec PCC 2000	28:48.4	6:04.3
North Star Horizon	12:01.9	1:57.7
Cromemco System Two	14:52.6	2:48.0
Texas Instruments 771	22:05.4	3:38.1
Vector Graphic System B	19:30.0	5:56.5
Decstation 78	7:55.7	4:21.5
Radio Shack TRS-80 Model II	20:00.7	3:38.6
Apple II+	21:11.0	6:17.4
Digital Microsystems DSC-2	13:24.9	3:28.8
Ohio Scientific C3-A	12:10.7	15:49.3
Alpha Micro AM-1011	5:18.3	3:25.3
Data General CS/10 Model C1*	58:21.0	2:40.3
SD Systems SD-200	17:42.8	6:16.4
Wang 2200SVP	2:13.3	2:23.0
Altos ACS8000-15	5:39.3	3:52.7
Altos ACS8000-6*	7:54.5	1:35.1
NEC Astra 205	14:27.9	5:10.8
Dynabyte 5300	5:39.5	4:38.0
Billings BC-12 DF2M	21:48.6	5:09.2
Smoke Signal Chieftain 9822	3:13.3	1:40.7
Commodore CBM-8032	23:45.1	3:36.0
Vector Graphic 3005*	11:34.1	2:26.9
Xerox 820	24:37.0	5:30.1
IBM Personal Computer	17:29.6	9:21.8
IBM 5120	35:29.7	4:16.2

* Tested with hard-surface disk rather than floppy.

clude the keyboard, with 27 special function keys, and a very efficient screen-oriented editor. Recent price in the configuration tested: \$9,890.

- Altos ACS8000-15 and ACS8000-6. The Altos had good run times; again, use of a compiler slowed the total time for compile-and-run. The hard

version of Basic, well written documentation and an integrated hard disk. Price: \$14,600.

- Dynabyte 5300. The Dynabyte was moderately fast in run-time comparisons. It uses the same Microsoft, Inc. compiled Basic as the Altos system. The system was tested using Dyna-

This is the 53rd in a series of articles giving the highlights of benchmark tests conducted on popular small computer systems. The full reports are available from the Association of Computer Users.

disk Model 6 naturally outperformed the floppy-based Model 15 for the accounts receivable problem. The systems use CP/M. When purchasing the Altos, the user must configure the system components. This might add versatility but should be approached with caution by those with little computer knowledge. Recent price for the ACS8000-15: \$8,875.

- Wang 2200 SVP. Overall performance was excellent. It turned in the fastest time in the scientific/engineering problem. Extra programming time may be required, however, due to awkward file-handling capabilities. Wang offers several application programs, an enhanced

byte DOS, an expanded version of CP/M. Other operating systems available are Digital Research's MP/M and Oasis. Multiuser expansion is available and hard disk storage of up to 29M bytes is offered by the company. Current price as tested: \$7,835.

- Billings Computer Corp. BC12 DF2M. Timing ranged from good to fair. It is marketed with a fast printer (180 Hz), which boosted performance in tests where that was a factor. The operating system is a single-user version of Oasis, providing some advanced facilities. Recent additions to the line are a Winchester hard disk and multiuser and networking capabilities. Users

praised dealer support. Current price: \$11,395.

- Commodore CBM 8032. The system did well in the accounts receivable problem. Its other timings were fair. The 8032 was designed with business use in mind. It includes graphics, but some capabilities are missing from the Basic interpreter, and disk I/O programming is cumbersome. Documentation available left room for improvement as well. Price: \$4,085.

- Smoke Signal Chieftain. Excellent results on the benchmark programs were obtained with the Chieftain. Its Unix-like operating system takes full advantage of the 6809 processor and has multitasking capability. The language supplied, called Basic-09, is an enhanced version and allows user-defined data structures. Hard disk and multiuser expansion are available. Smoke Signal relies on outside vendors and OEMs for applications software. Users reported a lack of software on the market. Price: \$8,149.

- Vector Graphic Inc. 3005. Timings were in the good to excellent range. The Z80A and CP/M were used for this system, and a 5 M-byte hard disk is included. Word processing, an electronic spreadsheet and other applications are available from Vector. The company now offers a cartridge tape drive and spooling capability. Price as tested, including letter-quality printer: \$11,150.

- Xerox Corp. 820. Timings ranged from good to poor. The system is CP/M compatible and offers minifloppy or 8 in. floppy drives. Maximum memory space is 64K bytes. Xerox supplies word processing and other applications software. Price with letter-quality printer: \$7,220.

- IBM Personal Computer. Performance on both problems was fair. The 8088 processor uses a CP/M-like operating system written by Digital Research and a version of Basic in read-only memory. IBM asks users to program around a bug discovered in double-precision arithmetic output; future versions will contain the fix, IBM said. Features of the system include a high-quality keyboard and monochrome monitor, optional color graphics, light pen and joystick, a full-screen editor and excellent documentation. Price: \$4,550.

- IBM 5120. Tested early in the 12-system series but now replaced by the System/23 Datamaster, the 5120 gave a good accounts receivable performance, but was sluggish in the scientific/engineering test. Price when offered was \$13,705.

Overall, computers are offering the same or better performance at lower cost than ever. But, much more than sheer speed is necessary for user satisfaction. In a forthcoming column, the role benchmarks should play in computer selection will be discussed.

Segal is president of the Association of Computer Users, a nonprofit association with members in the U.S., Canada and several other foreign countries. A package of information about the Association of Computer Users is available from the group at P.O. Box 9003, Boulder, Colo. 80301.

Hospital Speeds New Project Approval Process

KANSAS CITY, Mo. — Baptist Memorial Hospital here is using a "Hospital Data Book" and a Hewlett-Packard Co. 7221 plotter to expedite the approval process for new projects and conduct long-range planning.

"When we request Certificate of Need approval for new projects, we must supply the local health planning agency with information on the size and nature of our service area, patient origin and a variety of utilization and reimbursement data," according to Dennis McClatchey, assistant director of Baptist Memorial.

The hospital must also document a need for the project along with support that the hospital's present services are compatible and consistent with the proposed new service. In the past, the hospital was confronted with unending columns of figures, McClatchey said. Now, the requirements can be established within seconds by using the graphics charts for the Hospital Data Book (HDB).

Provides Graphics Charts

The HDB — provided to hospitals by Health Data Products (HDP) — reduces statistical information to graphics charts, which can be reproduced by the HP 7221. Software provided by SAS Institute, Inc. is used in conjunction with the plotter.

"The plotter works with the SAS software to produce accurate, multi-color charts with minimal effort," said Steven Edison, HDP director.

The HP 7221 plotter interfaces with an Intel Corp. Model A56 computer in Santa Barbara, Calif., which in turn integrates data from a variety of other sources concerning institutions, communities, patients and physicians. It is this statistical raw data that the plotter turns into useful information.

The process begins when the hospital requests reports. As in the case of Baptist Memorial, these reports focus on long-range planning and feasibility studies, as well as on what services are likely to be required in the future.

"The hospital must first decide exactly what information it needs during a given period in order to make sound planning decisions," said McClatchey. "The final data book is only as good as the information upon which it is based."

The hospital then provides demographic and medical data on all patients it has treated within a given time frame. This, plus data on the institution's physicians, constitutes the hospital specific data base.

Uses Four Data Bases

Next, the computer accesses four other data bases, drawing specific information from each. The first — obtained from the Commission on Professional and Hospital Activity — is a comparative patient data base, which consists of information on approximately eight million patients. The second is a master facility inventory, which contains information on the 7,000 hospitals in the continental U.S.

The census and demographic data base holds information about the general community in the hospital's geographic area.

The final file consists of national

Medicare claims data, which tells where every Medicare patient lives (by Zip Code) and in what hospital he is treated.

After HDP receives the hospital specific data, it is edited, categorized and entered into the SAS data base. Next, the SAS applications software integrates the hospital specific data with the other four data bases.

"What we do next is use the plotter to convert data into information," Edison said.

This is accomplished by asking the computer specific questions for which the hospital requires answers: Where do most of our patients live? What is the severity of the cases we treat? Do we have too many brain surgeons and not enough coronary

care doctors?

According to Edison, the questions usually cover four major areas of concern to the hospital. The first is marketing and concerns competition, pricing and other marketing information.

Who Pays?

The second area concerns who pays for the medical treatment.

It is extremely important to the hospital administrator to know what types of patients are being treated, since reimbursement from certain sources is often dependent on the severity of the disease or injury.

The final area of concern involves the services provided. The types of physicians available are usually com-

pared to the types of diseases and injuries treated.

Once the questions have been asked, the HP 7221 goes to work. "The multicolor capability, the ability to interface effectively with our SAS software and reliability were the main reasons for choosing the HP plotter over other models," Edison said.

"With many colors, we can present a variety of information on one chart that can be understood at a glance," Edison said.

"It's hard to determine the exact amount of time we are saving with the data book," McClatchey said, "but it is significant. And because we now have our own data base, the entire planning process is made easier."

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CW/5-17

Called Technologically 'Illiterate'

Exec Claims DP Managers Failing to Keep Pace

By Robert Batt

CW West Coast Bureau
PALO ALTO, Calif. — Many DP directors are poor planners and communicators who are technologically illiterate and have lost credibility within their own departments.

This is the startling picture painted by management consultant Gopal Kapur during a recent interview here.

A former associate professor of DP at San Jose State University, Calif., Kapur maintained that in the increasingly complex world of computer technology, management is failing to keep pace with technology and the growing staff that goes

with it.

In some cases "there has been a complete abdication by DP management of their responsibility to manage new technology over various phases," Kapur asserted.

Firefighting

There is a lack of overall management methodology in many DP departments, he maintained. Due to the growth of software development over the last decade, a typical DP manager now spends 60% to 70% of the time firefighting. This leaves no time for strategic planning, Kapur said.

"Very few DP managers spend any time on true knowledge maintenance," he continued.

"They are functionally illiterate, unable to manage either the technology, the users or their staff. Few of them spend any time on their own self-development and so they don't know what questions to ask," he asserted.

This state of affairs, according to Kapur, has lost senior DP managers and directors much of their credibility in the eyes of the programmers and analysts who work for them.

A DP manager who is not

technically up to date can have a deleterious effect on company and program efficiency, Kapur said. His lack of commitment will soon spread to staff members and, if the DP organization goes bad, it affects the whole company, he said.

"With the proliferation of information processing, DP requires an out-of-balance attention compared with its revenue size. Data bases, for example, go across all functional lines," Kapur explained. And poor DP management leads to wasted resources typified by the emergence of fragmented data bases in user departments, he said.

Resistance to Standards

There is also a lack of commitment to technical standards for projects and programs among DP managers, the consultant continued.

According to Kapur, many of these executives resist walk-throughs and checklists. They are, he argued, unable to convince staff members of the necessity for walk-throughs because they themselves do not adequately understand this technique.

The data processing profes-

sion in general has been overprotective about its status, according to Kapur. As a result data processing is mismanaged and haphazard, he argued.

Communication Problems

These technical deficiencies are compounded by an enormous amount of ignorance concerning the importance of business and interpersonal skills, he continued.

Many DP directors, he pointed out, have virtually no experience in organizational management. Few have studied organizational research or organizational development.

"They [DP managers] have no statistical breakdown of established patterns."

The maxim, he said, seems to be "when in doubt, reorganize."

The solution to these problems, said Kapur, lies with the DP manager, who must increase his commitment, lay down procedures and automate his own activities.

"How many DP managers have an on-line log of production history tied to performance criteria. How can you manage if you don't know what went on?" he asked.

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Firm Drives Printer on TI Mini

DALLAS — A direct marketing company here needed typewriter-quality sales letters, but also wanted the entire process of producing them to be computerized.

Direct Response Group, Inc., therefore, decided to become the first company to drive an IBM 1403-N1 printer with a Texas Instruments, Inc. DS 990 minicomputer.

Formerly, the firm had been using a mainframe service bureau to print its sales letters, DP manager Martin Woodall explained.

"When volume grew to 500,000 pieces some months, with some batches as small as 2,000 letters, we had to print

the letters in-house for both economic and quality control reasons," Woodall said.

Features of 1403

The 1403 permits interchanging type trains, he explained, and Direct Response Group prefers IBM Wide Courier font, which is commonly found in IBM typewriters.

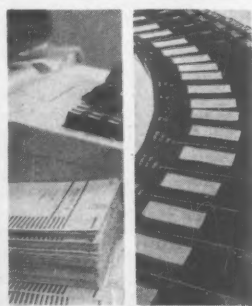
The 1403 prints with a quality that makes the finished product resemble personalized letters.

Computers for Business, which leases the data processing system to Direct Response Group, advised the

user that Spur Products Corp. of Los Angeles manufactures controllers that enable non-IBM computers to drive IBM 1403 printers. Woodall explained that Spur Products made slight modifications to an existing model to meet the need.

The company selected the 1403-N1 model, reportedly the fastest in the line at 1100 lines/min.

Previously, the fastest printing speed Direct Response could obtain with its own printers, that it uses for mailings that do not require letter quality, was 600 lines/min, Woodall said.



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Dispersed DP Zaps Exterminators Billing Woes

MEMPHIS, Tenn. — Dispersed data processing has exterminated growing accounting problems at a nationwide termite and pest control company headquartered here.

Terminix International, Inc., with annual sales exceeding \$120 million, is one of two nationwide termite and pest control companies in the U.S. Its 101 branch offices submit accounting data that generates 140,000 invoices monthly.

"When a company is as dispersed as ours, it can take four to five days to get one day's information gathered when you depend on manual record keeping and the mail," observed Dave Arnold, manager of systems development. "Then you have to add additional days for keypunching all that data and transferring it to the mainframe computer where the actual invoicing is done."

Terminix's quest for a dispersed data processing network began two years ago, at a point when its data was getting less and less accurate and timely, with the result that the firm was falling behind in the collection of current charges.

11 Vendors Considered

After considering equipment from a total of 11 vendors, Terminix chose Datapoint Corp. 1500 desktop processors as the arms of its IBM 4341-based system. "We needed dispersed data processing to get our information faster," Arnold said. "Datapoint provided the software to do that."

The initial installment included one 1500 and a 6600 advanced business processor at headquarters and another 1500 in the Memphis branch. When the first dispersed processing between the Memphis branch and Memphis headquarters proved successful, Terminix went ahead with the installation of 1500 processors throughout its national network.

"The equipment was operational as soon as it came out of the box," Arnold recalled. "It took only three days to configure the system exactly the way we wanted it. Then we set about developing our dispersed data processing applications."

Data is input to the 32K-byte 1500 series processors at the branch offices by clerical, bookkeeping employees. "We didn't have to hire DP experts to operate the processors in our branch offices," Arnold observed. "We had an implementation team from our home office DP staff that traveled to each branch to train the managers and bookkeepers who would

use the processors."

The entire installation process took one year to complete, including the concurrent implementation of a new accounts receivable system, he indicated. The only problem encountered during implementation was staff resistance to the technology.

"At first, our employees were concerned about turning their jobs over to the computer," Arnold said.

"They had been working with the hand-written system for years and had control over the data. Now the computer had taken control and the change frightened them."

User fears were overcome by the "friendliness" of the system. "The screen display matched the paper journals we had been using," Arnold noted. "And we didn't take a bookkeeper and try to turn

her into a computer operator — we just changed her method of working, so the computer became an office tool much like an adding machine."

Instead of losing their jobs to the computer, the bookkeepers found they could do their jobs more efficiently. "One office recently reported that daily bookkeeping, which had been an eight-hour job, is now a two-hour

process," Arnold pointed out. "The bookkeeper is now proud to be able to take on additional responsibilities."

Furthermore, instead of four or five days for information processing, "with the dispersed network, by 10:00 this morning, we have the information on all of yesterday's transactions," Arnold said. The result is that 99% of current charges are now collected when due.

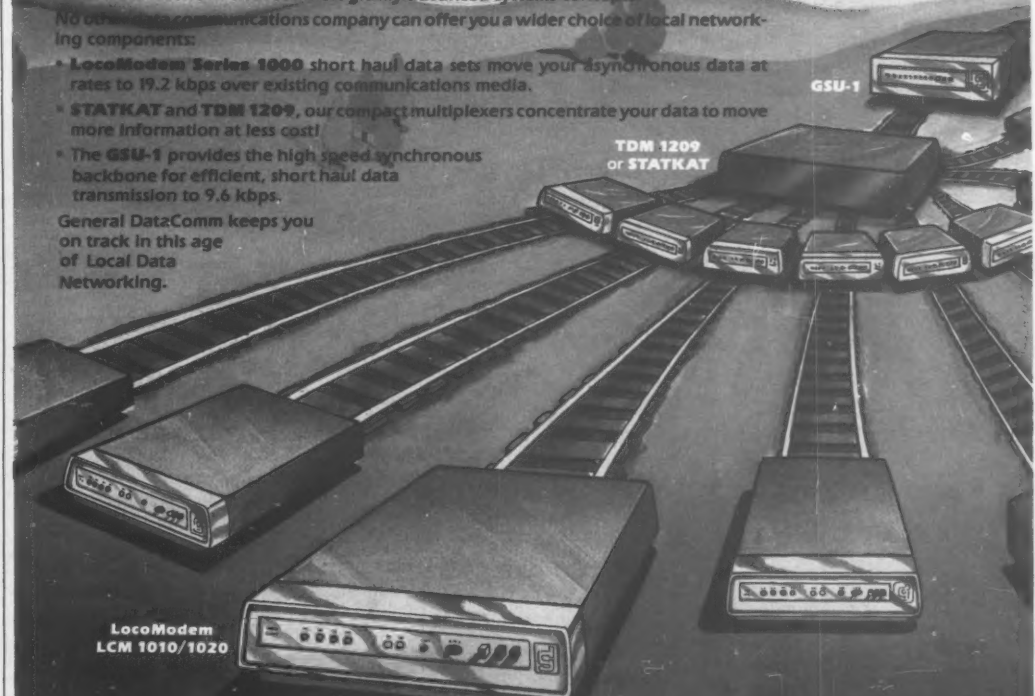
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Calendar

June 7, New York — **PL/I Programming.** Contact: Software Education Corp., Grace Building, 37th Floor, 1114 Ave. of the Americas, New York, N.Y. 10036.

June 7, Northridge, Calif. — **IMS/ADF Advanced Techniques.** Contact: IMS Consulting, Inc., 17654 Gledhill St., Northridge, Calif. 91325.

June 7-8, New York — **CAD/CAM Systems: Planning, Equipment Selection and Application.** Contact: Seminar Department, Datapro Research Corp., 1803 Underwood Blvd., Delran, N.J. 08075.

June 7-8, Toronto — **Data Communications: Advanced Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1803 Underwood Blvd., Delran, N.J. 08075.

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June 7-8, New York — **Data Base Management Systems: Concepts and Guidelines.** Contact: Seminar Department, Datapro Research Corp., 1803 Underwood Blvd., Delran, N.J. 08075.

June 7-9, San Francisco — **Computer Software Packages: Evaluation and Selection.** Contact: Seminar Department, Datapro Research Corp., 1803 Underwood Blvd., Delran, N.J. 08075.

June 7-9, Chicago — **Telecommunications Management: Cost Reduction Techniques.** Contact: Seminar Department, Datapro Research Corp., 1803 Underwood Blvd., Delran, N.J. 08075.

June 7-9, Chicago — **Data Base Management Systems: A Comparative Analysis of General Purpose Systems.** Contact: Seminar Department, Datapro Research Corp., 1803 Underwood Blvd., Delran, N.J. 08075.

June 7-9, Chicago — **Computer Performance Measurement and Capacity Planning: Tools and Techniques.** Contact: Seminar Department, Datapro Research Corp., 1803 Underwood Blvd., Delran, N.J. 08075.

June 7-9, Washington, D.C. — **Distributed Systems: Effective Approaches and Applications.** Contact: Seminar Department, Datapro Research Corp., 1803 Underwood Blvd., Delran, N.J. 08075.

June 7-9, Boston — **Planning for Office Automation: Concepts and Practice.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 7-10, Washington, D.C. — **The Forty-Eighth International Operational Data Security Workshop.** Contact: Registrar, IACSS, Six Swarthmore Lane, Dix Hills, N.Y. 11746.

June 7-10, Vancouver, B.C. — **Computer Literacy, Intelligent CAI.** Contact: Adcis International Headquarters, 409 Miller Hall, Western Washington University, Bellingham, Wash. 98225.

June 7-11, Denver — **Eleventh Annual Meeting of the Mumps Users' Group.** Contact: Mumps Users' Group, Professional Associates, 2012 Big Bend Blvd., St. Louis, Mo. 63117.

June 7-11, New York — **TSO Interactive Debug.** Contact: Software Education Corp., Grace Building, 37th Floor, 1114 Ave. of the Americas, New York, N.Y. 10036.

June 9-11, New York — **Project & Team Management Workshop.** Contact: Anthony Formica, Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

June 10-11, Worcester, Mass. — **Data Communications.** Contact: Continuing Professional Education, Worcester, Mass. 01609.

June 11, Bethany, W. Va. — **Computers in Business.** Contact: Rick Williamson, Director of Continuing Education, Leadership Center, Bethany College, Bethany, W. Va. 26032.

June 12, Los Angeles — **CICS/VS Advanced Data Base and BMS Usage Workshop.** Contact: Expertise Extension Workshops, 220 N. Glenoaks Blvd., Burbank, Calif. 91502.

June 12, Anaheim, Calif. — **DL/1 Programming Workshop.** Contact: Expertise Extension Workshops, 220 N. Glenoaks Blvd., Burbank, Calif. 91502.

June 13-16, Los Angeles — **National Operations and Automation Conference.** Contact: American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

June 13-16, Knoxville, Tenn. — **Information — The Critical Difference.** Contact: American Society for Information Science, 1010 16th St. N.W., Washington, D.C. 20036.

June 13-17, Anaheim, Calif. — **The Third Annual Conference and Exposition of the National Computer Graphics Association.** Contact: The National Computer Graphics Association, Suite 330, 2033 M. St., Washington, D.C. 20036.

June 13-25, Harrisonburg, Va. — **Distributed and Teleprocessing Systems, Systems Development, Business Computer Systems: An Introduction and Structured Basic Programming.** Contact: James Madison University, Department of Business Education, Data Processing and Administrative Services, Harrisonburg, Va. 22807.

June 14-15, Minneapolis — **Increasing Quality & Productivity in Your Data Entry Department and Improving Supervisory Skills & Managerial Techniques.** Contact: The Data Entry Management Association, P.O. Box 3231, Stamford, Conn. 06905.



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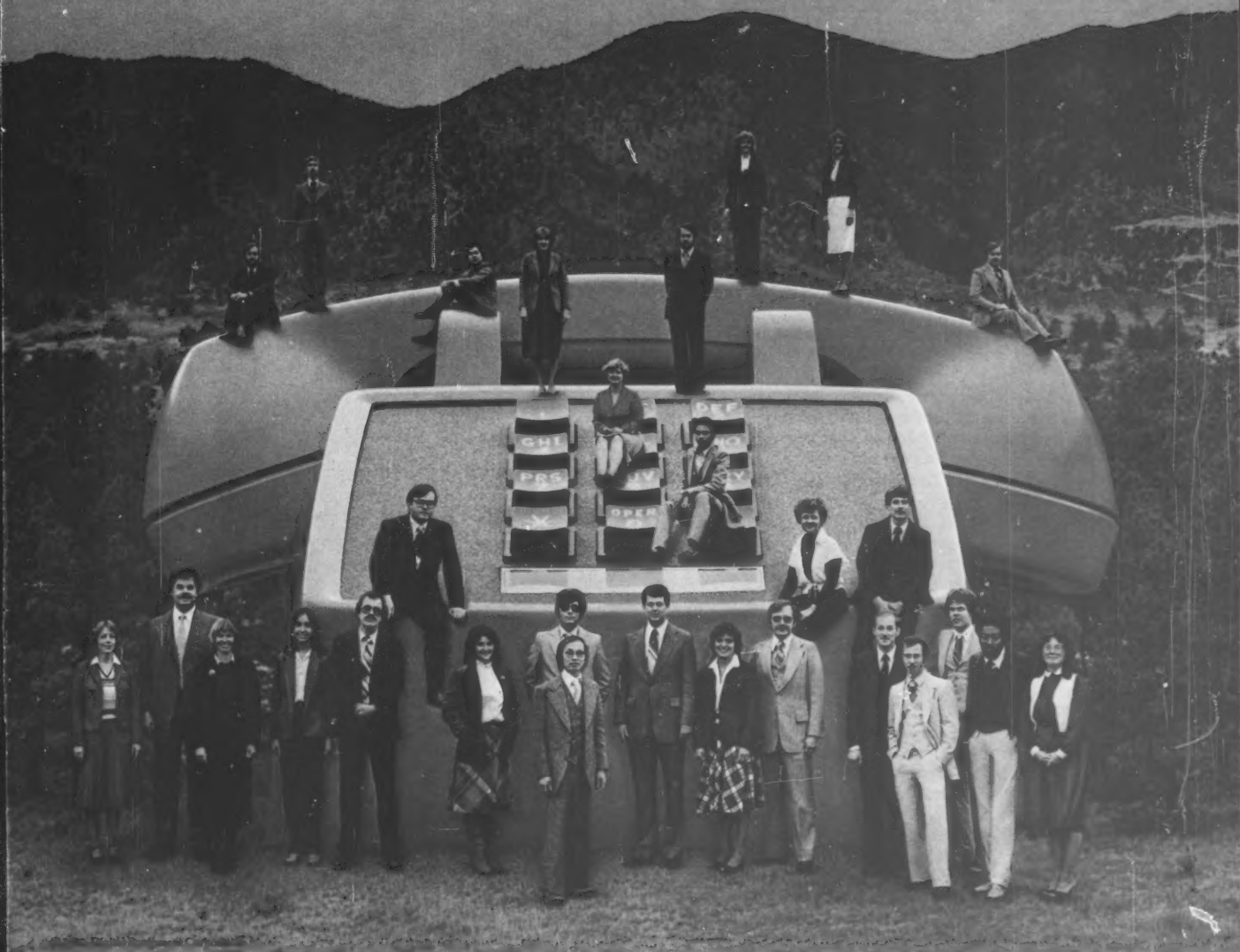
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EDITORIAL

Computer Games for Profit?

In the realm of computer abuse, it often seems that the courts help those who help themselves. And DP managers who encourage staff members to familiarize themselves with systems equipment and software by experimenting or playing at the terminal may be out of luck if those employees decide to take things further and utilize corporate computer resources for their own profit.

The New York Board of Education found this out recently when a New York criminal court judge ruled that using an employer's computer for one's own purposes is not a crime [CW, May 3].

Some managers agree that using a corporate computer for other than authorized work is not a criminal act. But executives contacted during a *Computerworld* survey were unanimous in the opinion that such personal use amounted to computer abuse, regardless of the court's ruling [CW, May 10].

Even if criminal prosecution is not realistic, an employee who grabs corporate DP resources for his personal use should definitely be terminated, according to these management information systems executives.

But is this reaction a fair one? Not unless the corporation has made it clear to employees which practices are viewed as acceptable in a given environment.

In some organizations, game playing at the terminal — at least during nonworking hours — is perfectly satisfactory. This type of informal interaction with the system is even encouraged by MIS executives who feel that any time spent at the terminal helps to develop familiarity with both hardware and software in an on-line environment.

But many corporations formally frown on after-hours terminal games. In addition to the undeniable drain they cause on computer resources, some managers feel that it may be difficult to draw a clear line between using the computer for personal learning and amusement and computer abuse for profit. Within these organizations, the responsible DP manager owes it to his employees and to the corporation to define specifically acceptable and nonacceptable behavior.

Managers who ignore this obligation must accept at least partial responsibility for staffers who regard corporate computers as a tool for their own personal use — or abuse.

DATA PAST

Five Years Ago May 30, 1977

ATLANTA — IBM expanded the main storage capacity of its System 3 line and enhanced the communications and systems programming support.

Maintenance diagnostic techniques for the System 3 were also improved, according to a spokesman.

— — —

NEW HAVEN, Conn. — By the year 2000, one million to 10 million secretaries could be put out of work by a data processing development that permits voice input to be translated directly into print.

It is the DP industry's responsibility to prepare society for this eventuality. Dr. Carl Hammer, director of computer sciences at Sperry Univac, told a group at the Data Processing Management Association's Northeastern Conference.

Ten Years Ago May 17, 1972

DETROIT — Burroughs Corp. nearly doubled the number of medium-scale computers offered to its users with the introduction of 13 models in the 700 series, including its first solid-state memory systems.

Burroughs also announced a new version, MCP-V, of its master control program for the new models as well as all B4700, B3500 and B2500 models.

— — —

CHICAGO — A Microwave Communications, Inc. (MCI) data user had its interstate MCI line disconnected by Illinois and Southwestern Bell without prior notice.

The Illinois Telephone Co. said a switch installed by MCI that allowed the user to alternate its Bell modem between MCI's line and a Bell system dial-up line violated a state tariff.



... And every so often I get this feeling that the network is about to give me the cold shoulder.

LETTERS

Clerical Productivity

Computerworld's interview with Karen Nussbaum ["9 to 5 President Raps Office Automation" CW, May 3] suffers from a major credibility gap. We are asked to believe that clerical workers are overworked, underpaid and in general lead miserable lives that office automation will only make worse.

Well, the reality is quite different, at least in the large Manhattan corporation where I have worked for the past nine years. As senior systems analysts, my colleagues and I have to do much of our own typing, photocopying and envelope-stuffing while the departmental secretaries spend half of the so-called working day on coffee breaks, socializing and just plain relaxing. Requests to type documentation are treated as immoral suggestions and at best are complied with grudgingly.

I assure Nussbaum that she has very little to fear from office automation. One morning at about 10 a.m. I had the privilege of seeing a word processing operator literally fall asleep at her console.

Management doesn't seem to care — after all, an executive wants a secretary of his own for prestige and who cares about the work as long as one has a secretary sitting outside one's office — so who am I to say the situation is not exactly as it should be?

Nor would I deny that many DPs are equally uninterested in delivering a good day's work for a very good day's pay. (Let's not tell the users, if they haven't figured it out themselves, but the key to that awful programmer shortage may be right there.) But it makes you wonder why Nussbaum so opposes the measurement of clerical productivity.

I look forward to the day when of-

fice automation will make it economically feasible for everyone in the company, from top executives on downward, to do their own office work.

Daniel Martin
Far Rockaway, N.Y.

'Fortress Mentality'

I would like to take issue with Donald J. Berardo's prescription for "handling" a data processing subordinate who, at a meeting in which outside personnel are present, challenges his manager's proposal "Handling a Back-Stabber in a Meeting" [CW, May 3].

Berardo seems to consider such an "outburst" a serious challenge to the manager's authority, as well as politically naive and grounds for threatening the employee's position in the DP department.

From Berardo's point of view, it appears that a meeting between DP management and outside representatives has but one purpose — to "sell" a proposal to the group. This represents an unconscious arrogance that is common among DP managers.

I believe that this attitude precludes true dialogue between DP and user departments. The purpose of a meeting, after all, is to elicit communications between participants, not to impose the DP manager's will.

A DP manager who treats conscientious objections to his proposals — whether expressed in meetings or elsewhere — as "back-stabbing" will quickly find himself in a fool's paradise of superficial consensus.

What data processing needs is more communication and less of the foolish fortress mentality.

John McBrearty
Senior Systems Analyst
University of California
Berkeley, Calif.

THE DATA CENTER/John P. Murray†

Measuring the Service Level of the Data Center

Because the primary function of the data center is service, not only must the service be of consistently high quality, it must also be measurable. Consequently, increasing pressure will be placed on the management of the data center to attain and provide a high level of service on a continuing basis.

Both the growth and the visibility of the data center will continue to be important management information systems (MIS) factors in the future.

What happens in the data center impacts many areas within the organization. Because the delivery by the data center of something less than perfect service can produce such emotional reactions on the part of data center clients, a factual, emotion-free system must be developed to measure the quality of the work delivered by the center.

Astute data center managers will realize the value, not only to themselves but to the entire organization, of developing a system that will allow them to produce an objective assessment of the work they do on a periodic basis.

One approach that should be considered is the data center service-level report.

'Astute data center managers will realize the value, not only to themselves but to the entire organization, of developing a system that will allow them to produce an objective assessment of the work they do on a periodic basis.'

el report.

The concept of the service level should be to develop a set of objective criteria that can be used to measure the effectiveness of the data center service. Once the criteria have been established, additional information about the direction of the data center effort can be provided on an empirical basis.

Examples of components of the service level are:

- **System Availability.** The goal here is to set and achieve a high level of system uptime. A minimum figure of 98% availability must be the baseline. Total availability, regardless of the causes of failure, should be used in the calculations.

Incidents such as operator error, an air conditioner failure or power failures that cause system shutdowns should not be considered aberrations.

The objective is to meet the minimum goal regardless of the cause of failure. Clients don't care why the system was unavailable; they only want it operational.

• **Response Time (Average).** This figure should be realistic, both from the standpoint of the data center and its client. Once acceptable averages have been determined, the information should be captured by software and reported on a regular basis.

It does not beg the issue to set the average a bit higher than necessary to allow for future load growth.

• **Delivery of Reports in Compliance With the Data Center Schedule.** One caution here: If a data center transmittal slip is not used for the release of reports from the data center, difficulties will arise. Clients will often assert that they never received a report or it is always late, when, in fact, they have misplaced it or failed to obtain it on a timely basis. The transmittal slip will provide verification of release of the report from the data center.

tion of release of the report from the data center.

• **Percentage of Reruns Caused by the Data Center.** This can be a difficult figure to develop. Factors such as quality of operator instructions, degree of operator training, operator experience level and quality of data center supervision, coupled with the occurrence of crisis management within the data center, are all factors that must be considered.

Some reruns must be expected. A reasonable goal, in the typical data center, might be set at 3% of the production load.

The reruns charged to the data center should be made up only of those reruns that can be traced to operational errors. Reruns caused by such factors as client error should not be part of the service-level configuration.

• **Client Relationship.** While this is the most subjective item in determining the service level, it may also be the most important. The long-term success or failure of the data center operation is often contingent upon the perceived belief of its clients with regard to service.

The use of a "service-level questionnaire" can prove helpful in assessing actual service. Users can rate each question on a scale of one to five, with categories ranging from poor to excellent.

Sample questions that might be included in the questionnaire are: How would you rate the overall service provided by the data center? How effective are data center communications? Do you feel you are informed about problems with your work on a timely basis? Considering all aspects of the data center operation this year, compared to last year, what is the level of performance?

Service-Level Value

Using the information from these sources, a numerical service-level value can be developed. A service level of 100% (assuming 100% is the highest level obtainable) would, of course, be the ideal.

Given that no data center is perfect, the level will be somewhat less than the maximum.

Using the service-level concept, the members of the data center can judge their progress, identify the weak and strong parts of the operation and take corrective action where necessary.

In the future, as the data center operation becomes a more integral part of the entire organization, the successful data center operations will be those that not only provide a high level of service but can also document the level of service on a factual basis.

It can be fascinating to see the improvement in client/data center relationships when facts, rather than emotions, determine the actual level of service.

Murray is director of MIS for Ray-O-Vac Corp., Madison, Wis. He is responsible for worldwide MIS activities. Murray has 20 years of DP experience, 10 of which have been devoted to the management of data centers.

HUMAN CONNECTION/Jack Stone†

Improving Data Center Management: How to Get Off the DP Treadmill

"My experience is that data centers are out of control — and the managers are too busy to know it."

So began the first of my formal interviews with the management team of the computer center at Catholic University of America in Washington, D.C.

The speaker was Stephen Roberts, assistant director, who was one of the kingpins of the center's multiyear effort to replace a strategy of management-by-crisis with one of management-by-control.

Here is Roberts' story:

"Nearly five years ago, when I first joined the center as a senior analyst, our systems and operations staffs were handling the work load in the conventional manner: fighting systems fires minute-by-minute. It was typical for the staff and me to stay up most of the night, ensuring that troublesome production jobs were completed before sunrise.

"Of course, we wouldn't see much of the center during prime shift when we'd be sleeping or, on occasion, out carousing.

"Production deadlines were usually met because we performed heroic services, at least as measured by center management. But the users thought differently.

"It's nice to get the output on a timely basis," they'd say to our management, "but your people are rarely around during the day to answer our questions or talk about systems improvements. It seems strange that the center is so preoccupied with night work. When do you intend to focus

This is Part 3 of a continuing series on how to succeed as a data center manager.

on your daytime business?"

"My colleagues and I were running on what might be called a data processing treadmill, expending vast amounts of creative energy in pursuit of a constant flow of nagging systems problems.

"Of course, the problems had to be solved, but they occupied the majority of our time and systems resources.

"Put into other words, we were in systems maintenance mode — like most other large-scale data centers — and I hated it.

"After a year of this suffering, I was promoted to my current position and quickly faced even more frustrations. In addition to helping in some of the critical systems areas after-hours, I had to be present during the day to backstop the missing analysts and programmers in responding to user questions and complaints about the previous night's production.

"I did a rotten job of it because I didn't have all the answers; I didn't want to spend my entire mortal existence at the center searching for them and I couldn't easily find the staff member responsible.

"It was impractical to direct the staff to come in during the day because they were too groggy to redesign and debug programs. And supervisory effectiveness was at ebb tide — if the staff showed up at odd

hours, how could there be effective communications?"

"I was fed up. I was working longer and longer hours, my users were more angry than ever and the staff turnover was likened to movement through a revolving door.

"I no longer wanted to participate in an operation that compared with a roller coaster and merry-go-round wrapped into one. I wanted my friends and neighbors to think of me as a normal human being who comes home after the day's labors and watches TV or fixes the plumbing or goes to parties like they did, and not think of me as some social misfit who works bankers' hours and is all zonked out with the latest electronic razzmatazz.

Ending the Madness

"One day, after a particularly outspoken user rankled my nerves, it all sort of welled up inside of me and I decided to end the madness, but not by quitting, as I did in previous jobs. This time I was going to solve the problem, no matter how long or how hard the task.

"I vaguely remember storming into the office of Karl Thomas, the director of the center, and fairly well shouting something like:

"This operation is berserk, and I want to straighten it out before they carry me off in a straightjacket."

"Karl surprised me when he answered, ever so quietly, 'Do it.'"

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

Software Industry's Myth

I have just read Werner Frank's "Problems That Plague Software Development" [CW, March 29] in which he argues that the success of the building industry should provide a model for the software development industry.

Frank asks: "... aren't most buildings finished as prescribed, on schedule and within their budgets?"

He neglects to answer this question, implying, I believe, that the answer is obviously "yes." I would argue that the answer is "no."

In fact, there is no large industry that is consistently capable of organizing large numbers of independent workers to attack arbitrary problems in a guaranteed fixed period of time at a guaranteed cost.

The software industry's insistence on maintaining the myth that "ev-

eryone else does it right, why can't we?" is unfortunate.

J.R. Swenson

University of Toronto
Toronto, Ont.

Defining 'User-Friendly'

I would like to take exception to "Minis Spur Increase in User-Friendly Systems, Giving Users Tools to Create Own Programs" in the special report "The Race for People Productivity" [CW, April 26].

The author makes extensive use of the term "user-friendly," yet he does not define user-friendly and, in fact, misuses the term.

For example, the idea that nonpro-

cedural tools are by definition user-friendly indicates a complete misunderstanding of the concept of user friendliness. It is very much like saying that a particular dish is by definition tasty.

User friendliness, as well as tastiness, is an individual preference. User friendliness is not an inherent characteristic of a system. It is only appropriate to call a system user-friendly when it meets the user's needs, matches his characteristics and fits the way in which he normally operates.

User friendliness is an important economic issue today. Systems that are hard to use (not user-friendly) will most likely be rejected and be-

come economic failures.

Human factors have proven to be a very difficult area for the computer industry to address because they are people-oriented rather than things-oriented, and most DP people are things-oriented.

Computerworld is very influential in the computer industry. It would be of even better service by being more accurate in the use of human factors concepts.

Roy L. Chafin

La Canada, Calif.

Time for Reassessment?

What bothers me about Ray Dicasali's In Depth, "Cash Management" [CW, April 15], is what it reveals about the state of systems development.

Is it really possible that there are companies that have automated (or even manual) financial management subsystems that do not include provisions for cash flow analysis? If so, it is time to reassess the quality of systems design specifications and performance as well as to reconsider the qualifications of those who buy and sell systems.

If, in fact, financial management subsystems are being conceived and installed on the piecemeal basis projected by Dicasali, then it is probable that personnel management, procurement management, supply management and other requisite subsystems of any integrated management information system (MIS) are being treated similarly.

That would indeed be a sad commentary on the state of the art. It would also indicate the need for those who want an integrated MIS to specify a holistic approach if they wish to avoid buying redundant and conflicting fragments that serve only a fraction of their goals.

Brian Le Bert-Francis

Falls Church, Va.

In Favor of Cobol-80

I would just like to go on record as being very much in favor of the new Cobol-80 standard.

The well-thought-out changes reflected in the recent document should not be thrown out the window.

As an experienced programmer/analyst, I applaud the excellent (and much needed, I must add) improvements to the Cobol-74 standard and feel that perhaps the American National Standards Institute X3J4 subcommittee did not go far enough.

It is very unfortunate if the Cobol-80 standard does not appear to neatly mesh with the current quarterly profit projections of vice-presidents, chief executive officers and corporate controllers.

If Cobol is to continue as a viable and widely used language it must at some point discard some of its antediluvian design flaws.

Finally, the cost benefits (brought by the language improvements and addition of structured constructs) will far outweigh any conversion-related inconveniences or impact on short-term budgets.

Capitulating to a few vociferous and myopic managers now will only help to sink the management information systems ship later on.

Jeff Mayers

Los Angeles, Calif.

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Using All-Screen for Data Entry

BAC First User of Genesys 'HRM' Package

By Lois Paul
CW Staff

CHARLOTTE, N.C. — "The first time one of our people designed a screen, it was our payroll manager. He learned how to do it in two hours and he doesn't know how to type."

With this anecdote, Marlene Nicholson, corporate economics manager for Barclays American Corp. (BAC), began describing her firm's experiences as the first-installed user of Genesys Software Systems, Inc.'s Human Resource Management (HRM) software package, including its All-Screen

interactive data entry and inquiry facility.

BAC, which was acquired by Barclays Bank International in 1980, is a financial services organization that provides consumer financial services, asset-based lending services to companies and intermediate term lending and factoring.

Several years ago, the company decided it needed a computerized human resource management package to replace a home-grown payroll system and to provide a personnel system, which until then had been lacking, according to Nicholson.

After a long evaluation process, Barclays

narrowed it down to three finalists: Information Science, Inc. (Insci), Management Science America, Inc. (MSA) and what is now Genesys.

Genesys was formed in 1981, by several former Wang Laboratories, Inc. employees, essentially to continue development and marketing of Wang's Human Resource Management System.

"The others seem to have good payroll and not so great personnel or, in the case of Insci, there really is no plain vanilla package. Everything is customized," she said. Nicholson noted that BAC is "not much for customizing packages. We want to take them off the shelf."

The Genesys HRM package, which includes benefits management, personnel and payroll, was installed toward the end of 1980. Subsequently, the All-Screen facility was developed. "When we bought the system we stipulated in our contract that Genesys would provide some kind of on-line data entry and inquiry facility. The firm subsequently served as a beta test site for the All-Screen facility," Nicholson said.

BAC currently is running an IBM 3033 and is converting the DOS/VSE operating system it used for its former mainframe,

(Continued on Page 42)

CICS Program Developer Bows

CAMBRIDGE, Mass. — Multiplications, Inc. has unveiled an on-line, menu-driven package intended both for designing and developing on-line Cobol applications under CICS and for running and maintaining these programs in a production environment.

Described as a noninterpretive, nonprocedural program development package, A CICS Cobol On-Line Applications Development Environment (Accolade) is available for users of IBM and plug-compatible systems running under OS/VS and DOS/VS. Its applications execute entirely in Cobol, the vendor explained, and the software generates system documentation as a product of the development process.

Accolade applications reportedly execute entirely in Cobol. The software is implemented as a hierarchical system of menu and data screens on an IBM 3270 or compatible terminal. It executes as an on-line transaction under CICS and is described by the vendor as an on-line application that is used to build other on-line CICS applications.

The package's facilities include an on-line screen generator called Maskeraid that is a Basic Mapping Support (BMS) preprocessor intended to enable programmers to design screens and generate BMS code on-line, without using Btam or having any knowledge of CICS.

Skeleton, an automatic program generator, is incorporated into Accolade to create structured Cobol source programs that structure transaction flow and handle data movement and data validation, the vendor said. Accolade has an on-line data dictio-

nary that generates copy books and provides full file documentation and a printer de-spooling management system for CICS and high-speed printer queues.

The OS version of Accolade is available immediately and is priced at \$34,500. The DOS version, which will be available in 30 days, is priced at \$25,500. Pricing includes one year of maintenance — which subsequently is an additional 14% per year — four days of training and materials.

Multiplications is based at 1050 Massachusetts Ave., Cambridge, Mass. 02138.

Decsystem-10, 20 Get Relational DBMS

CUPERTINO, Calif. — Accent R, a relational data base management system (DBMS) designed for use on Digital Equipment Corp. Decsystem-10 and Decsystem-20 minicomputers running under Tops-10 and Tops-20, respectively, has been introduced by National Information Systems, Inc.

Accent R includes a nonprocedural query language that is said to enable users to selectively query the data base and produce ad hoc reports, as well as to add, change and delete data items.

Also included is a high-level structured programming language designed to reduce applications development costs by enabling the programmer to use a structured environment that already has modeled the various components of DP applications. Using these section models, the user can add the appropriate statements, loops, logic, functions or subroutines to create the compiled module, which per-

forms the desired operations, the vendor said.

Accent R's data base manager is said to perform either simple or relational join operations from nonprocedural commands. In addition, it was designed to allow the programmer to vary from pure relational operations in its procedural language in order to handle large, complex applications.

The DBMS is described by the vendor as library-driven and its data base library includes an active data dictionary of the location of all the data elements. It monitors all related programs and applications system relationships.

The basic on-line license fee for Accent R is available for \$40,000. The installation fee is \$950. An optional user accounting component is available for \$2,000.

The vendor is located at Suite 245, 20370 Town Center Lane, Cupertino, Calif. 95014.

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'Xbug77' for PDP-11 Updated

SOUTH PLAINFIELD, N.J. — Computer Interface Systems, Inc. has announced a new release and a price reduction for its Xbug Fortran debugging tool for Digital Equipment Corp. PDP-11s.

Xbug77 is said to bring all of the Xbug features to users of DEC Fortran-77, in addition to users of Fortran-IV Plus systems. Programmers reportedly can place breakpoints at any statement with-

in a program, step through a program statement by statement, examine and change variables of any data type and cause breakpoints to occur whenever selected variables change value.

The software runs on any PDP-11 using RSX-11M and Fortran-IV Plus or Fortran-77. The reduced fees for the software are \$495 for Xbug, \$695 for Xbug77 and \$995 when ordered together from the firm at 124 McKinley St., S. Plainfield, N.J. 07080.

BAC First User of HRM

(Continued from Page 41)

an IBM 3031, to MVS. Nicholson said that the strongest point of the All-Screen facility is that designing screens really is not a problem. "There is no six-month system development project," she said. "You don't have to go through the product life cycle and get 40,000 people to decide. If you want a screen you just sit down and do it."

Another benefit of the All-Screen facility, according to Nicholson, is that BAC employees now have immediate access to data. They do not have to resort to printouts or dig into personnel files to get quick answers to questions.

The replacement of the homegrown payroll system with the Genesys HRM software has been a mixed blessing, according to Nicholson. "The system itself is good," she explained. "We have branches in a number of states and it keeps track of all the various different locality taxes."

However, from the user perspective, BAC has gone from a very tightly edited system in which most mis-

takes would be caught to a flexible system where there is room for error. "You have to be aware of data accuracy and that is a change," she said.

System Performance Tool Gets Enhanced Version

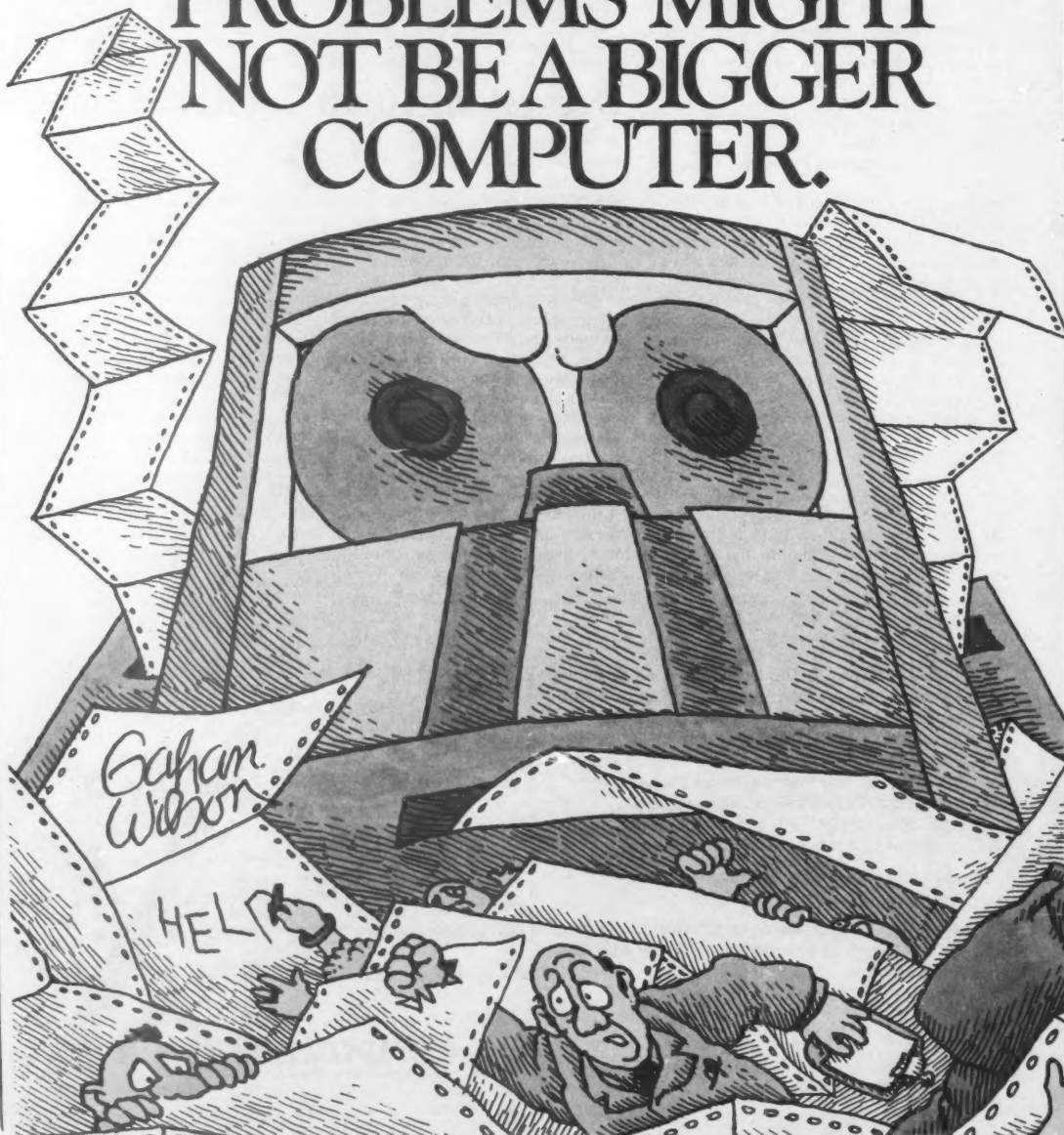
LINCOLN, Mass. — An enhanced version of BGS Systems, Inc.'s Best/1 performance calculator package has been announced here. Release 7 reportedly allows users to model the speed-matching buffers and dynamic path capabilities of the IBM 3380 disk and 3880 cache control unit.

Best/1 is an interactive analytic queueing model of com-

puter system performance. Its inputs are work load type, volume and resource requirements. It outputs response time, throughput and device utilization and a number of other measures of computer performance.

Release 7 of Best/1 ranges in price from \$22,500 to \$24,500, according to BGS Systems at P.O. Box 128, Lincoln, Mass. 01773.

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Offers Data Administration Support

Enhanced 'MPS' Runs on 370 Under DOS, OS

WASHINGTON, D.C. — Sage Systems, Inc. has announced Version 8.0 of its Maintenance Programming System (MPS), which now includes data administration support, a source code library interface, program logic analysis and a maintenance audit trail.

Version 8.0 of MPS reportedly runs on all IBM 370 and compatible equipment under

DOS and OS operating systems.

The enhanced software's Automated Dictionary Development System (AddS) was designed to build a file of systemwide data element usage and employs MPS reporting facilities to generate data administration reports.

Version 8.0 of MPS reportedly includes source libraries other than the standard

Copy library, including Applied Data Research, Inc.'s Librarian and Pansophic Data Systems, Inc.'s Panval. Data also can be gathered from the JCL input job stream.

In addition, the Program Logic Flow Analyzer feature of MPS has been enhanced to produce a report that, on a line-by-line basis, identifies every way in which that line

can be reached and all the places the logic may go afterwards, the vendor noted.

The File Comparison facility in Version 8.0 of MPS is said to be parameter-driven and allows for variable input record width. A permanent licence for Version 8.0 of MPS is available for \$9,000, the vendor said from Department PM25, 5161 River Road, Bethesda, Md. 20816.

'Unifacs' Fits System 80

BLUE BELL, Pa. — An integrated general accounting applications software package has been introduced by Sperry Univac for use with its System 80 computer.

Called the Univac Financial Accounting System 80 (Unifacs), the software reportedly is an ANS-74 Cobol-based, on-line interactive package that is compatible with the Unifacs 1100 software. It consists of four separate modules: accounts payable, accounts receivable, payroll/personnel and general ledger/budgeting. Each can be implemented separately or in conjunction with the other modules.

The individual module monthly license fees are accounts payable (\$195), accounts receivable (\$195), payroll/personnel (\$260) and general ledger/budgeting (\$225). Deliveries are scheduled to begin in the third quarter of 1982, the vendor said. The vendor can be reached through P.O. Box 500, Blue Bell, Pa. 19424.

Enhanced 'DRS' Fits IBM CPU Under MVS

ENGLEWOOD, Colo. — Versions 2.0 and 2.1 of Saturn Software, Inc.'s Data Recovery System (DRS) were recently introduced here.

Both versions are reported to run on IBM mainframes under the MVS operating system. Version 2.0 offers generic selection parameters, Isam support in both CICS and batch environments and a programmer tool for generation of test data and verification of test results. This product is currently available.

Version 2.1 will be available in June and will feature the Dynamic Step Backout Facility in the DRS Journal Control Program. This will enable users to back out optionally all Vsam data set changes on behalf of the address space if the batch address space should terminate abnormally, the vendor said.

Both packages cost \$8,000, a Saturn spokesman said from 7351 E. Hinsdale Court, Englewood, Colo. 80112.

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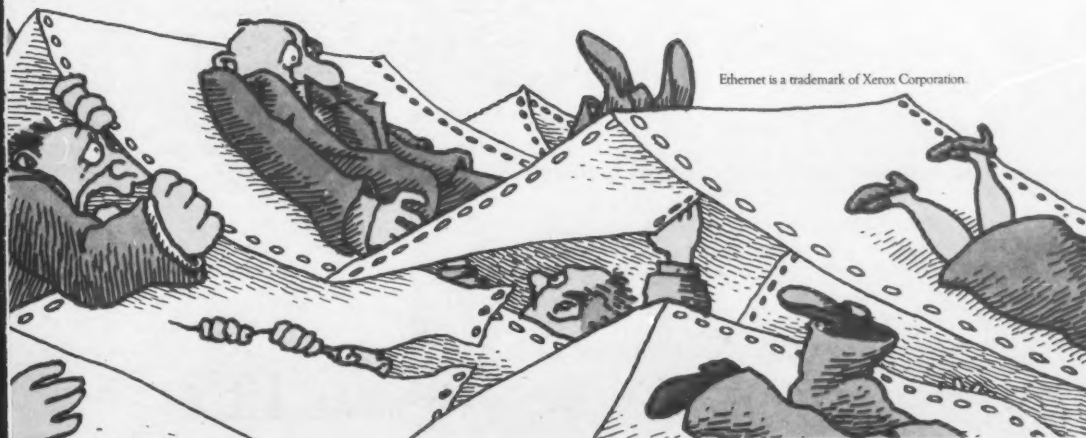
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Atlantic Management Enhances PC/70 Project Planning and Control

PHILADELPHIA — Atlantic Management Systems, Inc. has released an enhanced version of its PC/70 Project Planning and Control System designed for users of IBM 360/70, Series 30 and 4300 systems running under OS; and Hewlett-Packard Co.'s HP 3000.

The enhanced version of PC/70 is said to include page mode technology for both data entry and reporting and prompting and validation of data. Complete data recovery in the

event of hardware failure is included. Security features include operator password, terminal identification and specific transaction security, the vendor said.

PC/70 allows users to enter, maintain and report project planning and cost data in a conversational and interactive manner, according to the vendor. Users can perform "what if" planning without affecting the status of active projects, allowing simulated projects to contend with active projects for available resources, the vendor said.

The PC/70 package costs \$35,000 and is available from Atlantic Management Systems, 320 Walnut St., Philadelphia, Pa. 19106.

Control System Fits IMS DB/DC

WALNUT CREEK, Calif. — Integral Systems, Inc. has announced the Position Control System, designed to help IBM IMS DB/DC users to manage and administer their staffing plan through an inventory of all authorized staff positions.

The hierarchical Position Data Base is updated in an on-line interactive mode to provide the personnel function with the means to ensure that the organization's positions are appropriately classified, sufficient in number, efficiently distributed and properly funded, the vendor said.

On-line inquiry into the data base reportedly is provided to review each position's characteristics, position status elements and skills and education requirements.

Managers are provided with turn-around budget planning work sheets, and position budget and budget adjustment information are directly updated and accessible on-line, according to the vendor. In addition, a report writer is included in the package to do "what if" requests, arithmetic functions, summary reporting or simple lists, the vendor said.

A one-time license for the Position Control System is available for \$35,000, the vendor said from 45 Quail Court, Walnut Creek, Calif. 94596.

TI 990 Model 4 Gets Packages in Cobol

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. has released four packages written in Texas Instruments, Inc.'s Cobol for use on the TI 990 Model 4 and larger.

Inventory Management accommodates any number of warehouse locations for each item and allows warehouse transfers, issues and receipts. Customer Order Processing provides both single-pass customer invoicing and two-pass customer order entry with separate billing, the vendor said.

Bill of Material Processor is said to keep track of raw materials, subassemblies and finished goods. Release 2 of Accounts Receivable expands the salesman file to historically track sales, costs and commissions, both period-to-date and year-to-date.

The packages cost \$2,000 for the first use, \$800/use for a five-use license and \$600/use for a 10-use license, a spokeswoman said from 2441 Honolulu Ave., Montrose, Calif. 91020.

Three Accounting Packages Added for DG Enterprise System

WESTBORO, Mass. — Data General Corp. has added three general accounting packages to the software offerings for its Enterprise small business systems.

DG also announced a 25% price reduction for Enterprise 1000 application packages, as well as a third-party software development and acquisitions program for Enterprise systems.

The three new packages include general ledger, accounts payable and payroll, the vendor said, noting they will be available July 1. All are written in Business Basic. They reportedly were designed for use by novice operators and provide security through user-defined access to files

and screen menu selections.

The price for the applications packages for the Enterprise 1000 has been reduced by 25% to \$750 each (suggested retail), according to DG. The Enterprise 3000 applications packages are \$1,000 each (suggested retail). These prices apply to the new packages as well as to the already existing packages.

The third-party software development and acquisitions program for Enterprise computers is intended to encourage appropriate conversions as well as to seek out industry or function-specific packages to address the needs that DG feels it has identified in the very small business marketplace.

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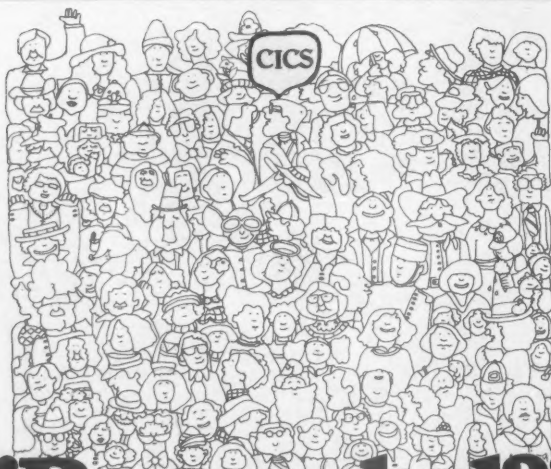
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Micronotes

Context Management Systems, Inc. has introduced **MBA**, an information analysis tool for IBM's Personal Computer and Apple Computer, Inc.'s Apple III.

The software reportedly combines programs for business graphics, word processing, data communications and data modeling. Requiring 192K bytes of main memory on the IBM Personal Computer and 256K bytes on the Apple III, MBA consists of two floppy disks (featuring a Pascal operating system) plus supporting documentation, a spokesman said. MBA is designed to offer more capabilities than the Visicalc business graphics package from VisiCorp.

Context will distribute MBA through retail stores such as Computerland outlets, which will begin selling the product for a suggested retail price of \$695 on May 17. The firm is headquartered at Suite 101, 23864 Hawthorne Blvd., Torrance, Calif. 90505.

Information Unlimited Software, Inc. has introduced the **Easy Mailer** software program for the Apple Computer, Inc. Apple II personal computer. The program is designed to create a form letter and mailing list to facilitate mass mailings. It is available for \$150 from the vendor at 281 Arlington Ave., Berkeley, Calif. 94707.

Stoneware, Inc. has introduced the **Graphics Processing System** software package designed to create, manipulate and edit graphics in the manner of a word processor with text, a vendor said. The program will run on the Apple Computer, Inc. Apple II Plus and costs \$59.95 for the standard version from the vendor at 50 Belvedere St., San Rafael, Calif. 94901.

Northern Telecom, Inc. has announced that the **Digital Research, Inc. CP/M operating system** will now run on its Model 503 desktop distributed data processing system. The CP/M operating system (level 2.2) on the Model 503 is available for a one-time license fee of \$250 from the vendor at 259 Cumberland Bend, Nashville, Tenn. 37228.

Oasis Systems has introduced **The Word Plus**, an enhanced version of the company's word spelling checker, **The Word**. The package will run on any microcomputer using the Digital Research, Inc. CP/M operating system. It is available for \$150 from the vendor at 2765

Keynard Way, San Diego, Calif. 92103.

Integron Systems has introduced **Sundial Release 1.1**, a time management system designed for maintaining lists, cross-referencing schedules and analyzing hourly billing. The package reportedly runs under Phase One Systems, Inc.'s Oasis operating system and costs \$400. Integron Systems is located at Suite 2, 300 W. 109th St., New York, N.Y. 10025.

The Insoft Division of O'Tech Group, Inc. has announced **Graforth**, a graphics programming language for Apple Computer, Inc. Apple II processors. Features include three-dimensional color animation, rotation, scale, transposition and perspective. The package costs \$75, the vendor said from 10175 S.W. Barbur Blvd., Portland, Ore. 97219.

Select Information Systems Co. has announced its **Select** word processing package will operate on IBM's Personal Computer. In addition, the firm announced two packages, **Teach/M** and **Converse**, for CP/M-based microcomputers.

The word processing package includes a self-teaching program that guides users through commands. Also included is **Superspell**, which checks for spelling errors and includes a merge-print feature. The package costs \$595, the vendor said.

Teach/M is an instruction package that can reportedly teach anyone to use the CP/M operating system in 90 minutes. The package is self-paced and costs \$75, the vendor said.

Converse is a telecommunications package for microcomputers that can assign frequently called phone numbers to a single digit, the vendor said. It can also automatically dial several commercial data bases. The package costs \$200, the vendor said from 919 Sir Francis Drake Blvd., Kentfield, Calif. 94904.

Innovative Software Applications, Inc. has announced a **Spelling Checker** designed for CP/M-86-based systems using the Intel Corp. 8086 microprocessor.

The Spellguard 86 package reportedly proofreads documents prepared with a word processor. Spelling can be checked at 20 page/min and the package comes with a 20,000-word dictionary. It costs \$295. A companion program that lists British spellings of words costs \$125. However, the package is offered for \$35 until June 30. The vendor is located at 1150 Chestnut Lane, Menlo Park, Calif. 94025.

C Cross-Compiler Offered

CAMBRIDGE, Mass. — Intermetrics, Inc. has announced a Bell Laboratories C language cross-compiler for developing microprocessor software on multiuser host systems, which initially will be Digital Equipment Corp. PDP-11 minicomputers running under Bell Lab's Unix operating system.

C-Port 8086 reportedly enables programmers to write and compile Intel Corp. 8086 microprocessor-based programs in C on a multiuser host, the vendor said. Users can take advantage of the host's full capabilities such as processing speed, large disks,

tapes and printers. The compiled C programs can be downloaded to the target microprocessors, such as 8086-based systems, for execution as pure machine codes.

C-Port 8086 includes a C preprocessor and supports the full C language including separate compilation, the vendor said. The code generated is optimized and intended for use in embedded read-only memory-based microprocessor applications.

C-Port is priced at \$4,500, including a maintenance and support contract. Intermetrics is located at 733 Concord Ave., Cambridge, Mass. 02138.

MRP II Evaluations Released

WILLISTON, Vt. — Manufacturing Software Systems, Inc. (MSS) has released two evaluations of new Manufacturing Resource Planning (MRP II) packages for IBM 4300, System/34 and System/38 computers.

The evaluations are of the Forman MRP package from Formation, Inc. for IBM 4300 and compatible systems; and the MRPS 34/38 MRP package from Data 3 Systems, Inc. for IBM System/34 and System/38 computers.

Christopher Gray, vice-president of MSS, described both packages as "good examples of a changing philosophy on MRP II software."

The Forman package was described as a continuous net change MRP sys-

tem with on-line simulation features and financial planning functions for cash-flow projections and inventory valuations. The Data 3 Systems package reportedly includes a comprehensive master production scheduling module, which can be purchased separately for use with IBM's Manufacturing, Accounting and Production Information Control System. Both packages are said to sell for \$100,000 or less.

The full evaluations are available for new MSS customers for \$625 each, with discounts available for existing subscribers to the library of MRP Software Evaluations. MSS Publications Department can be reached at P.O. Box 278, Williston, Vt. 05495.

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Unbundles 'Model' Prices

Lloyd Bush Revamps Modeling, Analysis Tool

NEW YORK — Lloyd Bush & Associates has announced a new release of its modeling and analysis software said to feature an interactive hierarchical consolidation system with data manager, Program Evaluation & Review Technique/Critical Path Method (Pert/CPM) and a Box-Jenkins Forecasting System.

At the same time, the firm unbundled prices on the

components of Release 6.0 of its Model software package.

Also added to the modeling software were multiple matrices and multidimensional modeling, Alpha data with full string manipulation, date data with date calculations and user-defined formatting, sorting and user-definable vocabulary, according to a company spokesman.

Model runs on Prime Computer, Inc. systems; Digital Equipment Corp. VAX-11; Hewlett-Packard Co. 3000; Sperry Univac Corp. 1100; Honeywell, Inc. DPS 8, 66 and 6000 under Gcos or DTSS; and IBM 370, 3000 and 4300 under TSO, CMS or DOS/VSE ICCF.

The basic Model software costs \$9,000, with 29 separately priced additional fea-

tures. A typical configuration for basic budgeting, planning and simple consolidation could cost \$20,000 to \$30,000, a spokesman said. The Hierarchical Consolidation/Data Manager costs \$18,000, Box-Jenkins costs \$3,000 and Pert/CPM costs \$5,000.

The firm is located at One Battery Park Plaza, New York, N.Y. 10004.

'A-Plus' Fits DEC PDP-11

LOS ALAMITOS, Calif. — Software Techniques, Inc. has announced a modular integrated financial applications package for Digital Equipment Corp. PDP-11s.

A-Plus, running under the RSTS/E or CTS500 operating systems, currently comprises an accounts payable module said to manage payables, track costs, maintain vendor history and assist in financial planning.

Introductory price for the one-time license fee is \$2,885, which will rise to "about \$3,200" in July, a spokesman said from Suite 101, 5242 Katella Ave., Los Alamitos, Calif. 90720.

Bank Tool Out for IBM

DALLAS — Pacesetter Systems, Inc. has announced an on-line processing package designed to aid check processing and savings and loan transactions at financial institutions using IBM and plug-compatible mainframes running under OS and DOS with CICS and Vsam.

Use of either an IBM 3604 or 4 Keyboard Display Terminal is permitted for on-line interactive banking applications. The product allows tellers to perform credit, debit and nonmonetary transactions by keying and verifying the appropriate data at the keyboard station.

The package starts at \$20,000 for the host site and \$30,000 for one to five controller sites, according to Pacesetter Systems at Suite 132, 4141 Blue Lake Circle, Dallas, Texas 75234.

'Udraw' Designed For HP 9845B/C

STAMFORD, Conn. — A business and technical graphics software package designed for the Hewlett-Packard Co. HP 9845B/C desktop computer has been announced by Sparacino Associates, Inc.

Udraw reportedly allows the user to generate graphics using the HP 9845B/C with 187K bytes of memory in conjunction with the HP 9111A Graphics Tablet. In addition to graphics, regression analyses of selected drawing inputs can be performed and the functions automatically plotted, the vendor claimed.

A "trace" mode reportedly allows the user to capture, edit and analyze existing hard-copy drawings. Udraw costs \$1,000 from the vendor at 175 Blackberry Drive, Stamford, Conn. 06903.



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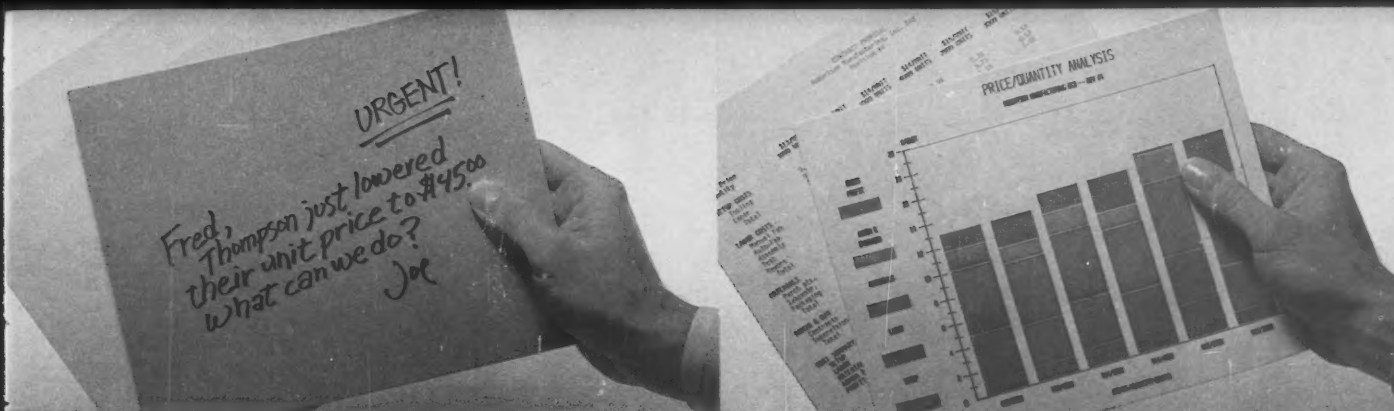
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'Osiris IV' Designed to Run On IBM 360 or 370 Mainframe

ANN ARBOR, Mich. — Release 4 of a statistical analysis and data management software package — Osiris IV — has been introduced by the University of Michigan's Institute for Social Research. It was designed to run on the IBM 360 or 370 mainframe.

The package was designed for data management and market research for social science research centers, governments and census data bureaus, public-opinion samplers, banks and other business institutions, a univer-

sity spokesman said.

It is said to have a general-purpose recording facility, matrix input and output and hierarchical data sets with variable-length records. It also performs cross-tabulations and classical regression and correlation analysis.

The one-year lease price is \$2,400 with a renewal fee of \$1,800. For nonprofit organizations, the lease cost is \$1,600, \$1,200 renewal; for degree-granting institutions, the lease cost is \$1,200 and \$900 for renewal. More information can be obtained by contacting Osiris IV Distribution, Computer Support Group, Institute for Social Research, University of Michigan, Ann Arbor, Mich. 48109.

MCBA Packages Out for PDP-11

MONTROSE, Calif. — Three manufacturing packages for Digital Equipment Corp.'s PDP-11 systems have been released here by Mini-Computer Business Applications, Inc. (MCBA).

The products were designed to integrate with the 10 other manufacturing and accounting packages of MCBA's Manufacturing Systems that are currently available.

The Purchase Order/Receiving package prints purchase orders, change notices and a variety of reports, the vendor said. It follows the progress of the order from requisition through follow-up, receipt, inspection, to deposit into stores. It also provides on-line maintenance of purchase order data, receipts and inspection data. This package costs \$3,000.

The Base Material Requirements Planning package is intended for small to medium-size manufacturers. It features master production scheduling and a daily shop-floor calendar. It reportedly generates time-phased requirements for all components in the product structure file and supports on-line initiation and report selection. This product costs \$2,500.

The Fixed Assets and Depreciation package handles basic accounting functions for asset acquisition, change and retirement, with periodic calculation of depreciation. This package is priced at \$2,000.

MCBA is headquartered at 2441 Honolulu Ave., Montrose, Calif. 91020.

'First' Enhanced For IBM Series/1

SAN PEDRO, Calif. — Alphameric Software has introduced an enhancement to its First software data base manager for the IBM Series/1 mini-computer. Screen Worksheet, a visual calculation and display system, is said to be useful for forecasting, budgeting and financial statements.

The Screen Worksheet can run as a stand-alone package or with the First package, the vendor said. It is said to allow hundreds of equations and numeric values to be stored in a 26 by 100 matrix, then be computed, formatted and displayed or printed.

The Screen Worksheet costs \$2,000, and the data base manager costs \$10,000. More information can be obtained by contacting Alphameric Software, Suite 222, 330 S. Miraleste, San Pedro, Calif. 90732.

Univac Introduces 'Tpas' for 1100

BLUE BELL, Pa. — A Transaction Performance Auditing System (Tpas) designed for use on its 1100 series systems has been introduced by Sperry Univac.

Tpas is said to provide a set of accounting and performance analysis tools for on-line transaction-oriented systems. Its modules reportedly react as an integrated system to provide personnel with performance measurement information that can be used to design and pinpoint performance bottlenecks, monitor applications design performance specifications, provide data for system sizing and performance modeling and identify site load irregularities and inefficiencies.

The software was designed as a system measurement tool that provides statistical data on resource utilization during transaction execution. The performance data generated focuses on CPU activities, I/O activity and memory utilization, the vendor explained.

A performance file utility package is included to create a data base of sorted Tpas records for subsequent manipulation by summary and report generation programs.

Univac will provide full support (Category 1) on the Tpas package, which currently is available for a license fee of \$500/mo. The vendor can be contacted at P.O. Box 500, Blue Bell, Pa. 19424.

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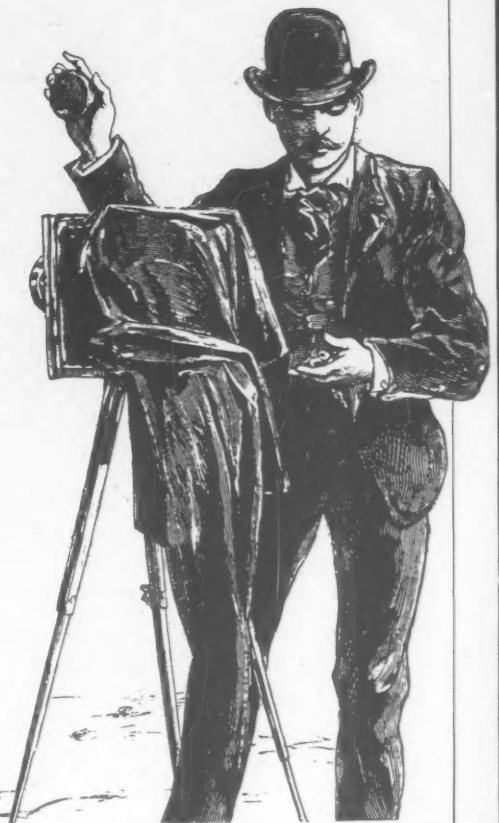
COSTS & BENEFITS

Part 1: Specification

Computer costs often exceed planned expenses, while benefits fall below expectations. How can managers and analysts make the right decisions for cost-effective computer systems?

Part 1 of this two-part series offers tools and examples for breaking down costs and benefits six ways. Next week, Part 2 will detail the five steps in cost and benefit determination, and how they pave the way for informed decision making.

By C. Warren Axelrod



TO EVALUATE THE acquisition, installation or development of computer equipment and software, to measure the extent of any improvement in computer-based systems or to determine the financial requirements arising from planned systems, one needs a clear picture of the costs involved. To judge the efficiency of computer hardware and software, to determine whether a change in a system is indeed an improvement or to justify the expenditures envisaged for a proposed system, one needs to define and measure the resulting benefits.

In Part 1 of this two-part series, we classify costs and benefits in the following ways:

1. Tangible vs. intangible.
2. Direct vs. indirect.
3. Controllable vs. noncontrollable.

4. Fixed vs. variable.
5. Certain vs. uncertain.
6. One-time vs. ongoing.

Examples of the types of resources falling into the various categories are provided for each of these methods of breaking down costs and benefits.

The second half of this series will go on to examine how the costs and benefits are determined. This involves the following steps:

1. Identification (of costs and benefits).
2. Classification.
3. Recording.
4. Analysis.
5. Interpretation.
6. Decision.

When costs and benefits have been specified and determined, based on the rules selected, we have the basis for evaluation, pricing, planning and control.

Specifying Costs, Benefits

As a first step, some typical computing-related costs and benefits are itemized and then

related to particular types of resources such as equipment, software and personnel.

Table 1 (on In Depth/2) lists some costs and benefits, segregated into resource groups. For each cost and benefit item, specific examples of the item category are given (for example, computer equipment includes CPUs, peripheral devices), and examples of the nature of the cost or benefit item are provided (for example, a peripheral device may be leased, rented or purchased). It should be noted that the items listed in Table 1 are representative of the major areas of computing costs and benefits, but the list is not all-inclusive.

To utilize costs and benefits effectively for analysis and evaluation, it is not sufficient merely to list costs and benefits and to apply numerical (dollar) values to each item. (Note that methods for determining the magnitudes of costs and benefits are examined later in this article.) It is necessary to characterize costs and benefits according to their most significant features and to

specify how such characteristics affect the evaluation process. For example, a decision maker views the certain stream of committed lease payments differently from the uncertain resale value of purchased equipment; a manager assumes a greater degree of responsibility for costs that are within his control, compared with costs over which he has little or no influence.

Characterization of costs and benefits can be effected relative to a number of features mentioned in the introduction. We now examine these characteristics in detail.

From a practical viewpoint, the most important segregation of costs and benefits is into tangible and intangible components. Simply put, tangible costs and benefits are those that can be readily identified and measured. Tangible costs appear on the books of organizations as disbursements or other recorded outlays or liabilities (for example, a reserve for taxes or bad debt may not involve an immediate

IN DEPTH

Cost and Benefit Categories	Resources	Examples	Nature
Tangible, direct	Equipment	Processors, peripherals, terminals	Purchase, lease, rental, use charges, maintenance, installation, insurance, legal, taxes
	Software	Operating systems, systems software, applications packages	Permanent license, periodic license, use charges, maintenance, installation, legal, taxes
	Supplies	Tapes, disks, forms, ribbons	Purchase, rental, taxes
	Staff	Internal, external (consultants, agency), part-time	Salaries, benefits, hiring fees, hourly rates, daily rates, fixed fee, taxes
	Space	Offices, plants, warehouses	Purchase, lease, rental, maintenance, insurance, legal, taxes
Tangible, indirect		Electricity, gas, oil, water	Use charge, fixed charge per period, charge per square foot, taxes
		Cleaning, security, mail, restaurant, linens	Charge per period, charge per square foot, charge per number of employees, taxes
	Equipment, software, etc.	Other cost center charges and benefits, general and administrative expenses and benefits	Allocated charges based on square feet, number of personnel, direct expenses, number of departments
	Equipment	Availability, appearance, quality of maintenance, flexibility, longevity, obsolescence, security	Time between failures, time to repair, experience of service personnel, ease of upgrade (field upgradability), modularity of design, planned enhancements, latest technology
	Software	Flexibility, portability, complexity (ease of use), security, quality of support, freedom from error, obsolescence	Modularity of design, programming language popularity, quality of documentation, experience of support personnel, time between failures, time to correct, planned enhancements, latest programming techniques and design approaches
Intangible, direct	Staff	Flexibility, adaptability, attitude, appearance, ability to learn	Academic qualifications, amount and type of experience, personal integrity, enthusiasm, creativeness, neatness, punctuality
	Space	Flexibility, location, availability, adaptability	Adequacy of utilities (e.g., power and telephone), closeness to transportation, closeness to qualified personnel pool, type of construction (i.e., single story, multistory, interior pillars, exterior pillars, steel frame, wood frame)
Intangible, indirect	Equipment, software, etc.	Other cost center costs and benefits, general and administrative costs and benefits	As for intangible, direct costs and benefits, plus opportunity costs and benefits, effects of delays, accelerated completion, bankruptcy, honesty, ethics

Table 1. Examples of Costs and Benefits Segregated by Resource Group


or precisely known disbursement but does represent a liability that will have to be covered at some time in the future). Tangible benefits appear as measurable reductions in costs, for example, or well-defined and readily identified revenue increases.

Intangible, or less tangible, costs and benefits are those that are not so readily identifiable or measurable. In some cases, they may be easy to identify but difficult to measure, such as the cost of delay caused by a breakdown in equipment. In other cases, they may be difficult even to identify, such as the improvement in corporate image derivable from the introduction of the latest on-line technology.

If intangible costs and benefits are ignored, as they often are in project evaluations, the outcome of the evaluation may be very different from one in which intangible costs and benefits are included. This is illustrated in Figure 1, which shows probability distributions of both tangible and intangible costs and benefits. The distributions are used to indicate the degree of uncertainty surrounding the estimation of the costs and benefits. The more tangible costs and benefits are assumed to be estimable with more precision, hence have narrower distributions than the intangible costs and benefits.

If the project is evaluated purely on a tangible basis, benefits exceed costs by a considerable margin, and such a project is considered a good investment. If, on the other hand, intangible costs and benefits are included, the total of tangible and intangible costs is seen to exceed the total benefits, making it an undesirable investment. Furthermore, the inclusion of intangible costs and benefits increases the spread of the distributions (as compared with tangible-only distributions), hence the uncertainty, with respect to the eventual outcome.

It might be helpful to illustrate the various concepts of cost and benefit



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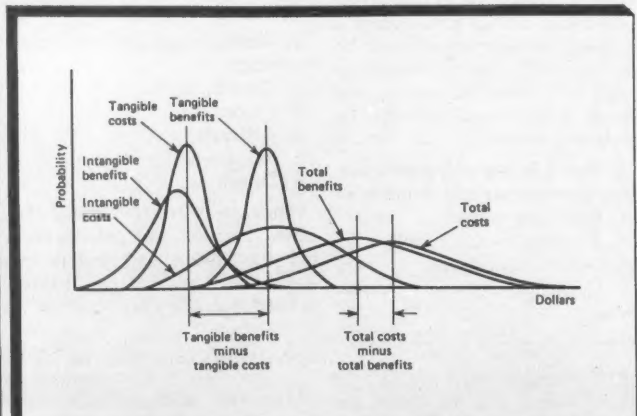


Figure 1. Tangible, Intangible and Total Costs and Benefits for a Particular Activity (or Investment).

characteristics by means of constructing a cost and benefit "space" — one for costs, the other for benefits. Figure 2 shows a cost (or benefit) space as it applies to an activity, such as the development of software for a particular application and/or the acquisition of equipment and system software or the hiring of additional personnel.

The entire universe of relevant costs or benefits is shown in Figure 2 as a roundish "island" within the bounds of which are all the costs (or benefits) relating to the particular activity, and the island exists in a "sea" of all possible costs (or benefits). The

department.

Indirect costs are incurred external to a particular activity or department. However, since the activity or department utilizes some part or aspect of those resources (for example, the use of the skills of the personnel department to assist in hiring staff for the computer department), the cost of those indirect resources can be partially attributed, or allocated, to computing activities or departments. Similarly, indirect benefits (for ex-

ample, a reduction in the overall cost of the finance department through the introduction of an automated budgeting system) redound to all activities or departments that are charged for such indirect services on an allocation basis.

Direct and indirect costs and benefits are most readily identified for tangible costs and benefits, respectively. However, in theory at least, if not in practice, it should be possible to segregate intangible costs and

benefits into their direct and indirect components. For example, an improvement in the quality (that is, accuracy, clarity, timeliness) of information that can be attributed to a new automated management information system for the administration department might be considered to be a direct intangible benefit. This should be differentiated from the cost savings resulting from a reduction in staff caused by the same system; these savings are direct tangible

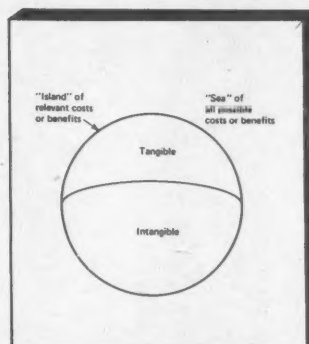


Figure 2. The Split Between Tangible and Intangible Costs or Benefits for a Particular Activity.

island can be dissected in many different ways, depending on the specific characteristics causing the division. On the basis of tangibility, the island may be divided into a tangible segment and an intangible one, as shown in Figure 2.

Although the dividing line is shown to be narrow and well-defined, in reality the split between tangible and intangible costs (or benefits) is fuzzier and broader, with the border area incorporating less tangible, somewhat intangible and rather intangible costs (or benefits), for example.

It should be noted that the combination of all tangible and intangible costs and benefits is considered to be a complete representation of all relevant costs and benefits pertaining to the activity.

Direct vs. Indirect

From a cost-accounting point of view, costs (in particular) are handled differently, depending on whether they are deemed direct or indirect. For a particular activity, direct costs and benefits are those that can be attributed directly to that activity. Direct costs are generally assigned to a particular activity or department (or other group within an organization). The resources underlying direct costs can be readily identified as being used to further the activities of a particular department, group or function. Direct benefits are those that are specifically attributable to a particular activity or to a

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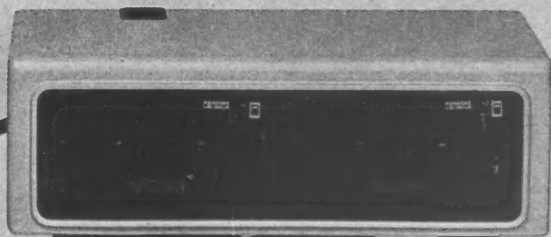
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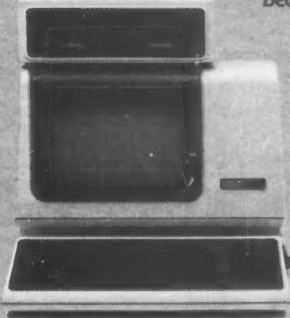
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Category	Item	Controllability	Variability	Uncertainty	Transience
Tangible, direct	Equipment, software	High	Moderate	Low (lease) Moderate (purchase)	Ongoing (lease) One-time (purchase) (Benefits—ongoing)
	Supplies	Moderate	High	Moderate	Ongoing
	Personnel (costs/benefits)				
	Management	Low	Low/moderate	Low	Ongoing
	“Worker”	Moderate	Moderate/high	Moderate	Ongoing
	External	High	High	Moderate	Intermittent
	Personnel (hire/fire)	Moderate	High	Moderate	One-time
	Space				
	Lease, Rent Purchase	Low Low	Moderate/high Low/moderate	Low Low	Ongoing One-time (Benefits—ongoing)
Tangible, indirect	Other departments	Low	Low/moderate	Moderate	Ongoing
	Shared items	Low	Low/moderate	High	Ongoing
Intangible, direct	Equipment, software	Low	Moderate	High	Ongoing
	Personnel	Moderate	Moderate	High	Ongoing
	Space	Low	Low	High	Ongoing
Intangible, indirect	Other departments	Low	Moderate	High	Ongoing
	Shared items	Low	Moderate	High	Ongoing

Table 2. Cost and Benefit Characteristics by Resource Category

benefits to the administration department.

Some benefits that are direct to the administration department are indirect to the computer department, for which the cost of administrative services is an allocated expense. The overloading of services, such as the cafeteria, bathrooms or security, resulting from adding staff in the computing area, for example, can be considered an indirect intangible cost. On the other hand, the automation of a financial system may lead the finance department to become aware

of potential improvements in some of its noncomputing activities; this is a less tangible indirect benefit from the computer department's viewpoint, but a direct, though less tangible, benefit for the finance department.

It is clear from the above discussion that, whereas tangibility is in some sense absolute and depends largely on the ease of measurement of the particular cost or benefit, directness of a cost or benefit depends on the manner in which costs or benefits are distributed throughout an organization

and on the particular point of view of an activity or department in relation to other activities or departments.

In Figure 3, the cost (or benefit) island is split into four segments—tangible direct, tangible indirect, intangible direct and intangible indirect. In Table 2, examples of tangible and intangible costs and benefits are broken down into their direct and indirect components.

Controllable vs. Noncontrollable

By “controllable” and “noncontrollable” costs and benefits, we mean those that the decision maker can modify with respect to magnitude and timing through direct action vs. those that are “givens” for a particular environment. The number and

skill levels of personnel may be within a manager's control, as may the amount of space occupied by the staff, but salaries are to a large extent subject to the existing labor marketplace. The cost per square foot of space may be outside the computer department's control since that cost was probably determined by the real estate department in its negotiations with the landlord (and those negotiations are heavily influenced by the marketplace, so that even the real estate department may have had very limited control).

It is generally held that direct and tangible costs and benefits are, for the most part, controllable, whereas indirect and intangible costs and benefits are not. The above example of the cost per square foot of space is one in which the cost is both tangible (measurable) and direct (to the computer department), but it is not controllable by the computer department in the short run. It should be noted that in the longer term it becomes feasible to move to a different location with, perhaps, a lower cost per square foot.

This indicates that controllability is determined not only by the type of cost or benefit and the domain of control of the decision maker, but also by the decision-making time horizon. Many items that must be tolerated in the immediate future, such as a sudden price rise for a particular commodity, can be compensated for over the long run by changing the nature of the operation, substituting other commodities or resources, relocating, changing financial approaches and so on.

For the purposes of this article, we shall view costs and benefits as controllable or noncontrollable within the time horizon for which decisions relating to those resources are usually made. Thus, as shown in Figure 4, most of the controllable costs and benefits fall in the tangible direct area, whereas the noncontrollable items are usually in the indirect and

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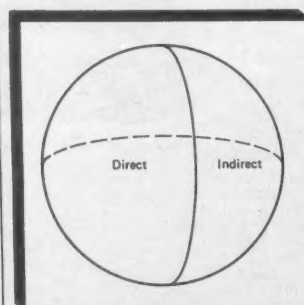


Figure 3. The Split Between Direct and Indirect Costs or Benefits for a Particular Activity (dashed line shows division between tangible [upper] and intangible [lower] costs or benefits).

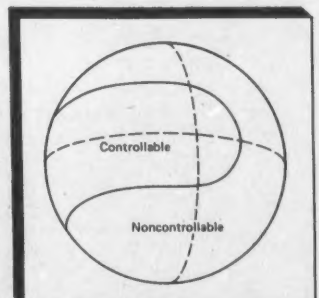


Figure 4. The Split Between Controllable and Noncontrollable Costs or Benefits for a Particular Activity (horizontal dashed line shows division between tangible [upper] and intangible [lower] costs and benefits; vertical dashed line shows division between direct [left] and indirect [right] costs and benefits).

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IN DEPTH

intangible area. The latter occurs because most indirect costs and benefits are under someone else's control, and intangible costs and benefits generally cannot be controlled by anyone — a subtle but important difference.

In Table 2, costs and benefits are classified roughly as to controllability. It should be noted, however, that such a classification is not precise and should be used for guidance only.

Fixed vs. Variable

Another feature of costs and benefits, which relates closely to their direct and indirect nature and their controllability, is variability. Costs and benefits vary in magnitude (1) over time, (2) with resource level and (3) with activity level (which promotes changes in resource level). Whether a cost or benefit is considered to be fixed or variable depends on the time horizon within which a particular decision is in effect and on the type of resource under consideration.

Ultimately all costs and benefits are variable. A 10-year, fixed-price lease for office space or a 20-year mortgage represents costs that are essentially fixed, even in the long term. However, even such commitments can be changed, for example, by terminating the lease early at some penalty or prepaying the mortgage and refinancing, if necessary.

In the computing environment, the outside planning horizon is generally two to five years, and many commitments for equipment and other resources are for less than four years, so variability can be considered in terms of a four- or five-year horizon. Facilities are often planned in terms of five to 10 years or more, but in practice the facilities decisions require revision after three to five years, since growth in space requirements generally outstrips expectations. For our purposes, we shall consider costs that are subject to commitments of more than three or four years as predominantly fixed. Similarly, activities that are expected to endure for more than three or four years have certain dedicated resources that are non-variable for the life of that activity.

The perception of cost and benefit variability is highly subjective and often incorrect. The selection of internal

and external computing services is characterized by an internal service with a high fixed-cost component and by external services characterized by costs that are variable with the amount of work

done. Many organizations tend to encourage use of the internal facility since, incrementally, little or negligible additional costs are incurred whereas, if moved outside, the computing services incur

significant additional costs.

Even in such a situation, the optimal decision may be to use both internal and external services since the benefits are not fixed, even on the internal facility, and

differ depending on which service is used. Often management considers certain costs and benefits to be non-variable, such as the need to utilize a computer that has already been installed, when

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Until now, if a business needed a printer with a wide range of scientific or multilingual characters, the choices were severely limited. And so was the print quality. Prices for these machines are high. And reliability is low.

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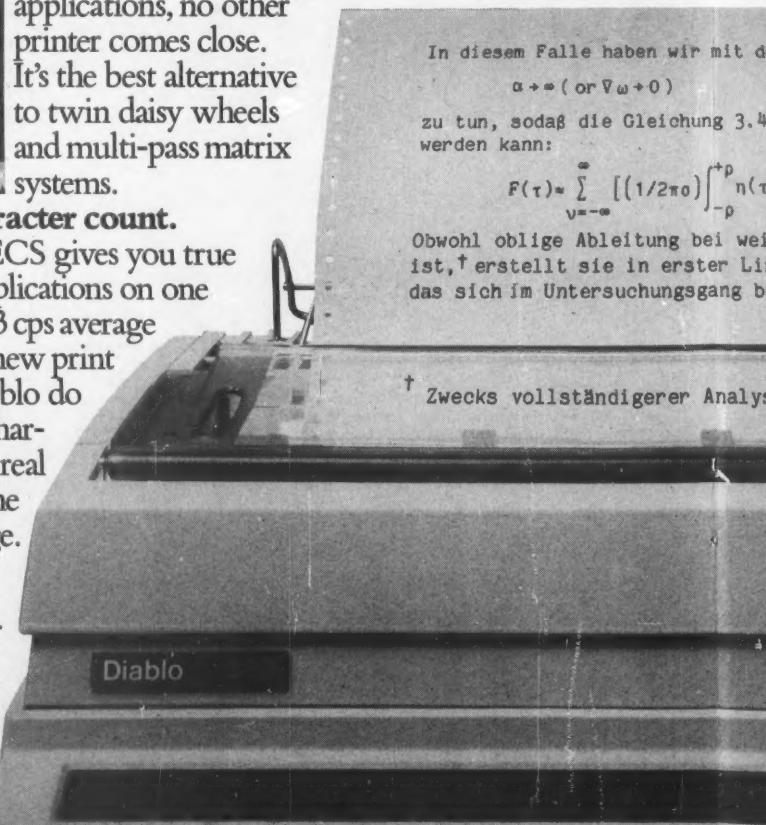
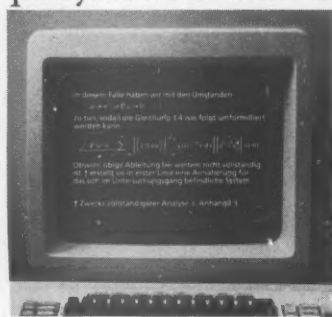
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*Extended Character Set



IN DEPTH

in fact it is feasible (though perhaps politically difficult) to change the current computer to a different, more cost-effective, one.

Variability can be controllable or noncontrollable. From

a managerial viewpoint, the greater interest is in controllable costs and benefits in terms of possible action. However, management should also be fully aware of the variability of costs and

benefits that are not controllable. Fixed costs and benefits, as discussed above, are not considered to be controllable within the planning time horizon.

An example of a controlla-

ble variable cost is maintenance contracted for equipment. Maintenance can usually be purchased to cover different time periods, such as weekday prime shift, 24 hours for seven days per

week, 16 hours per day (including prime shift) for six days per week and so on. If a particular piece of equipment has been acquired, hence the lease charge, say, for the equipment is fixed over a given term, the data processing manager can still choose the level of maintenance coverage desired, ranging, in some cases, from none (that is, maintenance is paid for on a per-call basis) to full 24-hour, seven-day coverage. It may also be possible to select from more than one purveyor of maintenance at different cost.

Some costs vary according to exogenous factors, such as sales volume, which are not under the direct control of the computer department. Thus the amount of overtime required to handle a peak in sales volume resulting from a special promotional campaign in the sales area is certainly a cost that is variable with sales volume but not controllable (except for minor training and scheduling gains) by the data processing manager.

Fixed costs, which are derived from long-term commitments such as contractual agreements for leasing, may have been controllable, hence variable, at the time they were being negotiated — but once the contract has been signed, the commitment to pay a specific amount per period is no longer variable.

The variability of benefits follows much the same pattern as that of costs. The net benefit (or savings) of reducing the amount of maintenance coverage for a particular piece of equipment is the difference between the reduction in the maintenance charge resulting from shortening the period of coverage, or eliminating coverage entirely, and the loss incurred because equipment was not available or because of the need for paying high per-call rates. The first component, namely, the maintenance charge reduction, is a controllable variable benefit. The losses incurred because of equipment failure during a period not covered by a maintenance contract are a noncontrollable cost.

The benefits derived from a fixed long-term lease include the reduced periodic payments and lower costs of administration and legal support arising from the lower frequency of contract negotiation and acquisition evalua-

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ir mit den Umständen

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$$\int_{-p}^p \eta(\tau) \epsilon^{-2\nu} \nu d\tau [\xi^3 + \xi^2] \quad (3.6)$$

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ECS

IN DEPTH

tion. On the other hand, the longer the commitment, the less the flexibility to change equipment to meet unanticipated capacity needs, for example. It is often possible to reintroduce some flexibility into a longer term commitment by paying some form of penalty for, say, lease termination or upgrading to equipment of larger capacity within the original lease. On the other hand, if the loss in flexibility is tolerable, the reduced cost of a longer commitment becomes a non-

controllable fixed benefit.

Figure 5 repeats the island shape of prior feature breakdowns and shows how the fixed and variable components apply to all the other characteristics.

The significant requirement in the evaluation of variability is the detection of those factors that cause the variation in specific costs and benefits. In Table 3, we show the degree of variability of various costs and benefits (also shown in Table 2) and

examples of major factors affecting their variability. For example, growth in the use of computer-related supplies, such as forms and ribbons, usually arises from a combination of new applications implemented on the computer and increased business volume for both old and new applications.

Certain vs. Uncertain

A major factor to be considered in the evaluation of activities and ac-

quisitions is the degree of uncertainty surrounding the various costs and benefits. The degree of uncertainty is usually expressed in terms of the probability that a particular event, such as "the equipment can be sold for 50% of its purchase price at the end of four years," will actually take place. Uncertainty is different from intangibility, since the event that is uncertain may have characteristics that are measurable with precision for all possible outcomes — it is just that the specific outcome is not known with certainty.

It is important that the analyst determine explicitly the degree of uncertainty for various possible outcomes and the magnitude of the cost or benefit for each of the outcomes to the degree that such magnitudes are measurable. Uncertainty is expressed as the probability that an event is expected to occur, with the sum of all possible events occurring with 100%, or 1.0, probability. The expected value of an event is the probability of the event occurring multiplied by the value of that event.

Thus, if the realization of \$50,000 on the resale of some equipment has a 50% probability, the expected value of that event is 0.50 times \$50,000, which equals \$25,000; that is, the expected value is \$25,000. If there is a further 50% probability that the equipment will sell for \$20,000, the expected value of this event is 0.50 times \$20,000, which is \$10,000.

Since the two above events cover all possible occurrences ($0.50 + 0.50 = 1.00$, which is the maximum total probability of all possible events), the total expected value of reselling the equipment is the sum of the expected values of all possible occurrences; that is, the total expected value is \$25,000 plus \$10,000, which equals \$35,000. Although the seller never actually realizes \$35,000 under the above assumptions (that is, he receives either \$50,000 or \$20,000, each with a probability of 50%), the \$35,000 represents a weighted average of all possible outcomes, weighted by the probabilities that the individual outcomes will occur.

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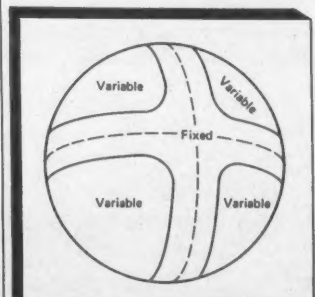


Figure 5. The Split Between Variable and Fixed Costs or Benefits for a Particular Activity (dashed lines have same meaning as in Figure 4).

IN DEPTH

the comparison of expected values.

As an example, we shall consider the choice of acquisition method for a piece of computer equipment where the available alternatives are a three-year lease at \$20,000 per month or purchase for \$1 million. For ease of exposition, we shall ignore the effect of taxes and discounting. Assum-

ing that all other costs (for example, installation, transportation and maintenance) are the same for both lease and purchase and that the lease charges are firm for the full duration of the lease (that is, no escalation clauses in the contract), the outlays for lease and purchase are \$720,000 over three years and \$1 million up

front, respectively.

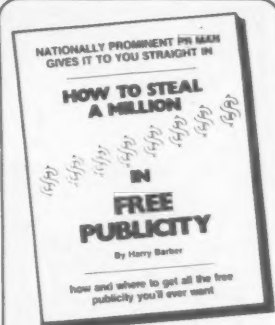
In the case of the lease, the equipment is returned to the lessor, its rightful owner, whereas if the equipment is purchased, it is to be sold at the end of three years at the then-prevailing market price, which is subject to a high degree of uncertainty since the price of used computer

equipment is highly volatile because of rapid changes in technology and competitive market forces.

If the equipment can be sold for more than \$280,000, purchase is preferred, since at \$280,000 residual value, the purchase option costs \$720,000 (that is, \$1 million minus \$280,000), which is the same as for leasing. If we assume that the resale value of the equipment can fall between \$100,000 and \$500,000, based on the historical trends for such

Category	Item	Degree of Variability	Major Factors Affecting Variability
Tangible, direct	Equipment Per unit	Moderate	Price/performance due to: 1 New technology 2 Economies of scale 3 Market forces (competition) Method of acquisition
	No. of units	High	Changes in business volume New applications Expansion of current systems New modes of operation (e.g., on-line, database, distributed)
	Software Per unit	Moderate	Price/performance due to: 1 New techniques 2 Market forces (competition) 3 Inflation Method of acquisition
	No. of units	High	No. of units of hardware New applications requirements New modes of operation New features for current systems
	Personnel Per unit	Moderate	Inflation Market forces (supply vs. demand) New skills requirements (e.g., database)
	No. and type	High	Growth in activities, especially data communications Changes in business volume, especially relating to computer-oriented activities Increase in automation in organizations Project/product related
	Space Per unit	High	Location of building(s) Market forces (supply vs. demand) Method of acquisition Quality of property, internal amenities, external facilities (transportation, etc.)
	No. of units	Moderate	Equipment and personnel requirements (storage, personal facilities, etc.)
Tangible, indirect	Overhead	Low	Size of organization Type of organization (e.g., business, government, academic) Nature of business, industry (e.g., capital intensive, labor intensive) Age of organization Maturity of industry Management style—efficiency, productivity Cost-accounting methods
Intangible, direct	Equipment, software, supplies	Moderate	Technological changes Market forces (competition) Relative power of buyer (vs. other buyers and vs. seller) caused by size of buyer, order, etc. Relative power of seller (vs. other sellers and vs. buyer)
	Personnel	Moderate	Market forces (competition) Image of employer (e.g., dynamic, conservative) Work environment, (e.g., pleasant, pressured) Quality of management (e.g., task, person oriented)
	Space	Low	Location Market forces (competition) Quality of building maintenance Architectural characteristics and quality
Intangible, indirect	Overhead	Moderate	Red tape (e.g., degree of bureaucracy, formality) Cooperation (e.g., interdepartmental, team attitude) Attitude toward amenities (e.g., eating facilities, benefit plans)

Table 3. Major Factors Affecting Variability of Costs and Benefits



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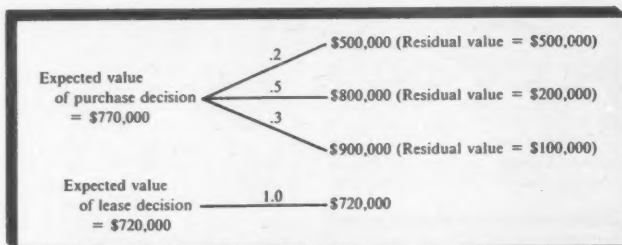


Figure 6. Decision Tree for Purchase Decision vs. Lease Decision

equipment and allowing for expected new technological developments, the relative cost of the purchase decision depends on the probabilities that the various residual values will be realized.

The uncertainty of the acquisition process can be illustrated by the decision-tree approach. Using the above example, as a result of surveying knowledgeable sources, we may determine that the expectation that \$500,000 can be realized on the resale

of the equipment has a probability of 20%, a \$100,000 residual value has a 30% probability and a resale value of \$200,000 has a 50% probability of occurrence. The decision tree for the purchase option with three possible resale values and the lease option is shown in Figure 6.

Using the prior definition of expected value, we see that the expected values of realizing \$500,000, \$200,000 and \$100,000 on resale are \$100,000, \$100,000 and \$30,000, respectively, for a total expected value of \$230,000. Thus, the expected value of the cost of purchase is \$1 million minus \$230,000, or \$770,000, which is \$50,000 more than the \$720,000 of the lease. Thus, on an expected-value basis, lease is the preferred method of acquisition.

Clearly, although on an expected-value basis lease is preferable, it is seen that 20% of the time one can expect to do much better if the equipment is purchased and resold for \$500,000. Since individuals do not always respond to a given situation in a totally rational fashion, it is possible that someone willing to take a gamble will still buy the equipment in the hope that the one-in-five event will occur and the decision maker will then be a hero.

It is evident from the many purchases of computers late in their life cycles that there are many individuals who do not operate on the principle of expected-value maximization but are willing to take a gamble. Unfortunately, many such gambles, especially some made by leasing companies that subsequently failed or suffered huge losses in the value of their equipment portfolios, have proven ill-advised.

Regardless of whether one believes in the power of the expected-value approach, few can deny the existence of uncertainty. The certain vs. uncertain breakdown is illustrated in Figure 7, and the specification of the levels of uncertainty displayed by various costs and benefits is shown in Table 2.

One-Time vs. Ongoing

Whether a cost or benefit occurs once or recurs is an important factor in the evaluation of different activities. For example, it is well-known in

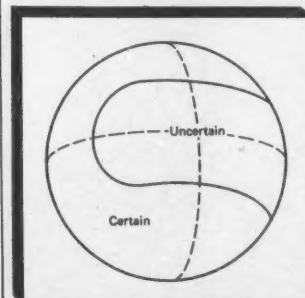


Figure 7. The Split Between Certain and Uncertain Costs or Benefits for a Particular Activity.

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the software development process that the cost of developing a system is essentially a one-time outlay, whereas the cost of running the system in production mode and maintaining that system is ongoing and involves costs that continue well be-

'Many very expensive mistakes have been made in the realms of language selection and the trade-off between development and production.'

yond the point at which the system is implemented. It is often possible, for example, by choosing a programming language with certain characteristics or by varying the amount of effort in the design phase, to incur lower development costs initially with resulting higher production and maintenance costs. The opposite can also be effected.

Certain programming languages, such as APL, and high-level languages such as Mathematica, Inc.'s Ramis or MRI Systems Corp.'s System 2000, are very easy to learn, and these languages allow applications to be developed in a fraction of the time required by such languages as Cobol or Fortran. But the former easy-to-use languages usually also require substantially more computer resources to run. Consequently, if an application is very large and/or is run frequently, the more efficient languages, which require more effort in the development phase, may be less expensive in the long run.

With the cost of hardware decreasing, particularly in comparison with

personnel costs, it is commonly believed that the inefficiencies of the easy-to-use languages are outweighed by the saving in expensive personnel time. This, unfortunately, is not always so, and applications (particularly the very large ones) must be evaluated on a case-by-case basis. Many very expensive mistakes have been made in the realms of language selection and the trade-off between development and production.

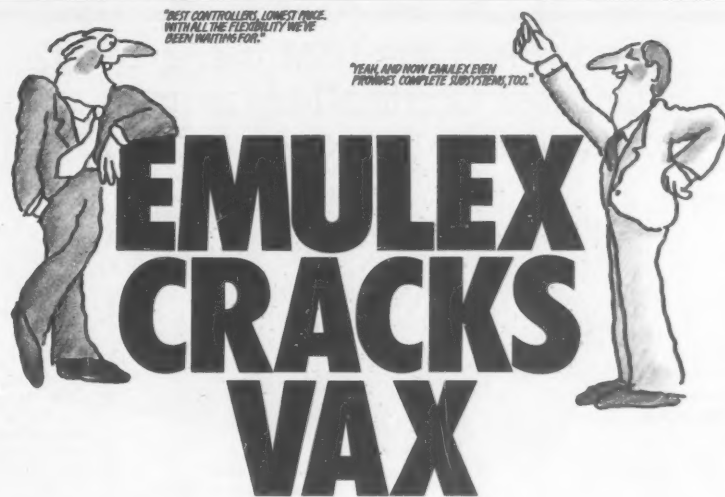
The decision as to whether to ex-

pend more resources in the initial (one-time) stages of an activity or in the later ongoing stages depends on many factors, including the availability of resources and skills to develop the applications, the frequency of the activity (such as continuous, daily or monthly), the amount and availability of resources required for ongoing production, the expected life of the system (in total or until replacement) and so on.

These same considerations can be

analogously applied to the purchase/lease decision for equipment, where the selection between an up-front expenditure for purchase and a periodic payment for lease depends on such factors as the availability and cost of funds and the anticipated useful life of the equipment.

Generally, one-time costs and benefits occur in the near term, except for longer term future one-time costs that may result from an anticipated conversion from one type of comput-



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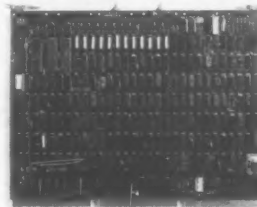
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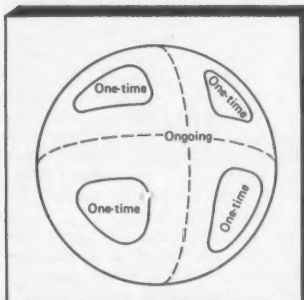


Figure 8. The Split Between One-Time and Ongoing Costs or Benefits for a Particular Activity.

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er to another or from one mode of operation to another and so on. Ongoing costs, on the other hand, are usually incurred year after year.

As costs (money outflows) or benefits (money inflows or cost reductions) occur further out in time, their effect on the overall evaluation is reduced because of the discounting of the cash flows to the present time. The net effect of discounting is to emphasize the initial one-time costs or benefits relative to the ongoing

costs or benefits. Furthermore, one-time costs and benefits to be incurred in the relatively distant future (for example, resulting from a conversion) have a much reduced effect on the evaluation because of discounting.

Although the differentiation between one-time and ongoing costs and benefits is somewhat different from the other characteristics in that it relates to the temporal aspect of costs and benefits, it is still appropriate

to break costs and benefits into the different segments shown in Figure 8 (on In Depth/15). It is also valid to characterize the costs and benefits in Table 2 according to whether they are usually one-time or ongoing, although in this case many of the costs and benefits have both one-time and ongoing components.

In Table 2, the predominant transience characteristic is shown. Perhaps the most important feature of one-time costs is that they are often

forgotten and excluded from the analysis or, if not forgotten, they are usually underestimated, especially if the costs involve site preparation, parallel running and so on.

Summary of Characteristics

The above discussion covers a number of major characteristics by which costs and benefits are to be differentiated for evaluation purposes.

The list of characteristics is not intended to be complete. Other characteristics become significant in certain circumstances, such as whether funds are obtainable from equity issues or debt, whether a project has been included in the appropriate budget, whether capital funds have been set aside for a particular investment, management's attitude toward risk or return on investment or the type of business it should be in.

Above all, the analyst must include all relevant characteristics, not just the magnitudes of costs and benefits, in evaluations of activities and acquisitions.

Next week: The five stages of cost and benefit determination in the conclusion of this two-part series.

About the Author

C. Warren Axelrod's work experience includes a wide range of data processing management activities: evaluation and implementation of new computer technologies, financial analysis of computer systems, capacity planning, computer scheduling and cost reduction of computer operations, both at Lewco Securities Corp. and Mobil Corp.

In addition to the book from which this series is excerpted, he wrote *Computer Effectiveness: Bridging the Management/Technology Gap*, which won the Elmer Grillo Memorial Award from the Association of Systems Management for outstanding contribution to the literature of systems management. His other published work includes some 20 articles in such journals as *Omega*, *Infosystems*, *Computer Decisions* and *Data Communications*. He has contributed chapters in two books: *Advances in Data Processing Management* (Heyden) and *The Economics of Information Processing* (Wiley).

Axelrod, who holds a Ph.D. from Cornell University, has served as president of the Metropolitan New York chapter of the Institute of Management Sciences.

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DataBriefs

Sytek's Localnet Receives Enhanced Software Package

SUNNYVALE, Calif. — Sytek, Inc. has released an enhanced software package for Localnet, the company's broadband local-area network. The software will be provided free of charge to existing customers and included in Localnet in the future, a vendor spokesman said.

Version 2 software is said to add modem control functions, security and error reporting. It provides support for advanced network control and management services. It allows users to retain call parameters and provides the capability to maintain a permanent connection.

A basic Localnet network costs \$1,175 and is available from Sytek, 1153 Bordeaux Drive, Sunnyvale, Calif. 94086.

Data Line Monitor Unveiled For Remote or Field Service

MONTGOMERYVILLE, Pa. — A Data Line Monitor (DLM) usable at a central data communications center, remote network node or field service has been unveiled by Digilog, Inc. The DLM III is equipped with a CRT, hexadecimal key pad and a built-in breakout box.

Bit error rate test, message generation features and terminal simulative capabilities are available for line diagnostics.

Selectable synchronous and asynchronous data rates range from 50 to 19.2K bit/sec in full-duplex mode. The DLM III is said to accommodate any industry-standard communications protocol.

The unit costs \$3,775 from Digilog, 1370 Welsh Road, Montgomeryville, Pa. 18936.

CCITT-Compatible Modem Made for Full-Duplex System

LEXINGTON, Mass. — Concord Data Systems, Inc. has introduced a CCITT-compatible data modem designed for 1,200 bit/sec full-duplex operation on two-wire dial telephone lines.

The CDS V.22 is said to operate with both synchronous and asynchronous data terminals, provide speed fallback to 600 bit/sec full duplex and function on two-wire leased telephone lines via an additional interface that is provided. The unit is said to adjust automatically the modem's receiver to compensate for telephone line distortion and drift.

The data modem is available for \$965 from Concord Data Systems, 430 Marrett Road, Lexington, Mass. 02173.

Satellite Earth Station Allows Data Rates to 9,600 Bit/Sec At a Cost of \$1,700 per Month

By Phil Hirsch

CW Washington Bureau

NEW ORLEANS — A satellite earth station that accommodates data rates as low as 9,600 bit/sec and leases for \$1,700/mo was unveiled here recently by Vitalink Corp. at the International Communications Association conference.

The company said its prices for the Dual-Trac earth station — \$1,700/mo on a lease basis or \$69,500 if purchased — are about half those charged by competitors. For an additional \$600/mo per station, Vitalink will provide dual duplex 9,600 bit/sec channels to and from Western Union's Westar satellite along with microprocessor-based switching and multiplexing capability.

Redundant message paths through the earth station electronics interconnect with

TI Enhances Dnos, Supports Fortran

DALLAS — Texas Instruments, Inc. has unveiled an enhanced Distributed Network Operating System (Dnos) environment to include support for Fortran '78 and enhanced capabilities for its small business machine, the Business System 200.

Dnos Fortran is a general-purpose multiuser, multitasking disk-based operating system that runs on TI's mid- to upper-range computer systems. It supports a full line of productivity aids including DBMS, Query, Soft/Merge, Tiform, Data Dictionary and word processing.

The software license price for Fortran '78 ranges between \$3,000 and \$3,800, the vendor said.

The enhanced capabilities intended for users of TI's Business System 200 are added support for 3780/2780 communications. This addition enables the user to communicate with other local or remote computer systems in distributed processing networks that use IBM's 3780/2780 communications protocol.

This package lists for \$500, according to TI at P.O. Box 202146, H-617, Dallas, Texas 75220.

the dual duplex channels to the satellite and comprise a major feature of the new system, a Vitalink spokesman said. They reportedly help prevent system failure.

Further protection, he said, is provided by the use of solid-state electronics and a dual microprocessor-equipped system monitor.

Although most data communication today is at speeds of 9,600 bit/sec or less, according to the spokesman, satellite carriers do not offer service at these rates. Also, the company contended that none of the existing suppliers — carriers or equipment vendors — have developed an overall solution to the data communications problem. Rather, they have typically provided earth stations or satellite transmission facilities, the spokesman explained.

Vitalink is the first vendor to integrate both components into a single package, he claimed.

According to figures supplied by Vitalink, it would cost a user \$8,300/mo to install a 9,600 bit/sec Dual-Trac data network interconnecting four locations — New York, Chicago, Houston and Los Angeles. By comparison, the cost of using AT&T's Dataphone Digital Service reportedly would be \$9,380.

The firm is located at 1330 Charleston Road, Mountain View, Calif. 94043

Interface Module Made for Wang

BELLEVUE, Wash. — Automated Control Systems, Inc. has introduced an interface module that reportedly allows Wang Laboratories, Inc. computers to interface with Televideo Systems, Inc.'s Models 950 and 925 CRT terminals.

The ACS 100 interface is said to work with the Wang 2200 series of computers and allows the terminals to emulate the Wang 2236 DE workstation, a Televideo spokesman said. The interface will plug into the computer's ports and the terminal.

The ACS 100 is available for \$600 from Automated Control Systems, 14218 N.E. 21st St., Bellevue, Wash. 98007.

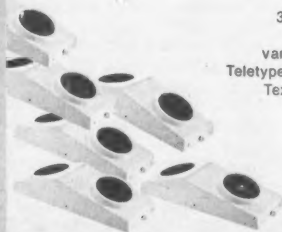
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One Portable, One Hand-Held

IDS Unveils Communications Test Sets

LINCOLN, R.I. — International Data Sciences, Inc. (IDS) has introduced two data communications test sets — one portable, one hand-held — a modem eliminator and a sharing unit.

The portable Hawk 4030 communications test set reportedly can test a modem or terminal, features a 20-char. data display and weighs 12 lb. The unit will perform test routines on synchronous, asynchronous and

isochronous systems at up to 19.2K bit/sec. It costs \$3,995.

The hand-held Model 67/60 tester is microprocessor-based and combines a full function Bit Error Rate Tester (Bert), polling test, echo test and user message generator with an RS-232C interface, V.24 breakout and monitor panel. The unit costs \$995.

The Model 6110 Modem Eliminator is designed to allow for the interconnection of data terminal equipment

without modems. It can be used in either synchronous or asynchronous modes and with half- or full-duplex terminals. Data terminal equipment can be located up to 50 feet from the unit, which costs \$370.

The Model 6101 Sharing Unit, priced at \$750, is said to allow up to four modems or data terminals to share a common communications device. The unit operates at up to 19,200 bit/sec in both synchronous and asynchronous modes.

IDS is located at 7 Wellington Road Lincoln, R.I. 02865.

Scitec Offers Multipoint MUX

NEWPORT, R.I. — Scitec Corp. has announced a point-to-point or multipoint statistical multiplexer that reportedly facilitates from four to 32 channels and allows the user dual trunking and chaining of the multiplexer and link speeds of 56K bit/sec.

The CPX 25 has a system management feature called Supervisor, which allows configuration diagnostics and status to be accessed from any terminal channel in a network via English menu-driven screen prompts.

The menu prompts enable simple selection of any feature by a single keystroke, the vendor said. All system-selectable parameters are stored in a nonvolatile memory for retrieval even after a system power failure.

The CPX25 costs \$1,850 from Scitec Corp., 126 Thames St., Newport, R.I. 02840.

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Bizcomp Modem Operates At 1,200 Bit/Sec

MENLO PARK, Calif. — Bizcomp Corp. has released a 1,200 bit/sec version of its Model 1022 Intelligent Modem and Hayes Smartmodem.

The Model 1012, a microprocessor-based 1,200/300 bit/sec intelligent modem is said to include full Bell system 212A compatibility and Bizcomp's patent-pending keyboard dialing.

An integral serial auto-dialer allows convenient keyboard dialing while the low-power, large-scale integrated circuit design allows cool running operation, the vendor said. A Thompson prefilter is said to assure data integrity. The built-in microprocessor provides a full complement of commands for controlling dialing, auto-answer, self-testing and programming modem parameters.

Applications include remote data-stations, store-and-forward electronic mail, computer-to-computer file transfers and automatic polling of unattended locations, the vendor said.

Model 1012 costs \$895 for two and is available from Bizcomp at P.O. Box 7498, Menlo Park, Calif. 94025.

Interfaces Fit Genius Terminal

HASTINGS, Minn. — Micro Display Systems, Inc. has announced four compatible interfaces for its Genius full-page display CRT terminal.

The RS-232, S-100 and Apple Computer, Inc.'s Apple II interfaces will be available next fall while the Apple II interface will be available next month, the vendor said.

The terminal is said to display 57 or 73 lines of text by 80 char. across, and to be fully compatible with Micropro International Corp.'s Wordstar and other CP/M-based software programs. The display has 8K bytes of high-speed buffer memory to refresh the screen.

An Apple II interface card is currently standard with the terminal and costs \$1,795 without keyboard. RS232, S-100 or Apple II interfaces also without keyboards will be available at the same price.

Quantity discounts are available from Micro Display Systems, 1310 Vermillion St., P.O. Box 455, Hastings, Minn. 55033.

Net Facility Added To Racal-Milgo CMS

MIAMI — Racal-Milgo, Inc. has added a Network Performance Facility (NPF) to its Communications Management Series (CMS) diagnostic and control systems. It is said to provide main channel data measurements in large-scale data communications networks.

While the CMS systems primarily measure hardware and line performance, the NPF is said to measure line protocol performance in the following: IBM 3270 Binary Synchronous Communications, 3270 Synchronous Data Link Control, 2780/3780, 2260/2848, Ascii II asynchronous, Sperry Univac Uniscope, Honeywell, Inc. VIP 7700 and Burroughs Corp.

The base price for the system is \$41,000. Additional information is available from the firm at 8600 N.W. 41st St., Miami, Fla. 33166.

Attention DEC users:



MTI has what you need to turn your VT100 into a CP/M personal computer.

Digital's VT 18X option can be installed on your VT 100 in just 15 minutes by your MTI field service representative. It features two 180K byte 5¼" mini floppy drives in a small box. A second dual unit can be added for a total of 720K bytes.

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CP/M is a registered trademark of Digital Research, Inc.

Facit Offers Terminal Option

GREENWICH, Conn. — Facit, Inc. has introduced a terminal option that reportedly enables it to produce all popular bar codes and alphanumeric characters of variable size.

The terminal runs on Facit's 4542 Flexhammer Printer with RS-232C or parallel input. It produces bar codes or characters ranging from 0.1-in. to 9.5-in. high, in 95 sizes at 0.1-in. steps in black or red print, the vendor said.

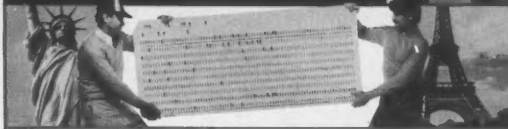
Any combination of bar codes and variable-size characters can be produced, according to the vendor. Superimposing can be done, allowing the use of backgrounds to emphasize solid characters.

Each type of bar code and variable-size character is said to be specified by a short control sequence sent before the bar code data or text.

The price for the terminal option is \$4,500 and it is available from Facit, 66 Field Point Road, Greenwich, Conn. 06830.

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Doomed to Disappoint User's Expectations?

Exec: Supercomputers a Step Behind

By Tim Scannell

CW Staff

TARPON SPRINGS, Fla. — Are number-crunching supercomputers doomed to be one step behind the problems they were designed to solve? Maybe, at least in terms of present limitations on semiconductor technology and the industry's need for more and more computer horsepower, according to Neil R. Lincoln, an executive consultant with Control Data Corp.

Speaking to a group of top executives who gathered here recently for a conference on future systems sponsored by Enterprise Information Systems, Inc., Lincoln gave his personal opinions on why he thinks supercomputers — although undeniably powerful — will never meet all users' expectations.

Armed with a handful of charts, Lincoln pointed out that no matter how much power present-day supercomputers deliver, users want eight times the capacity, more memory and more performance. And they want all of this as soon as 1985.

Lincoln pointed out that supercomputers traditionally have been "a generation behind the problems we are trying to solve." As an example, he cited Sperry Univac's Eniac — a mechanical behemoth considered to be one of the first supercomputers — which was originally developed for military purposes in World War II, but did not materialize until about two years after the war had ended.

The CDC consultant observed that super-

computers are not singular machines but rather a collection of pieces, one of which may be a number-cruncher. These pieces can be grouped into three categories: the machine's technology, design and structure.

Unfortunately, although the system design and philosophical structure are there, the semiconductor technology, which is "where all the magic is," may be holding things up.

Large-scale integration (LSI) chip technology is "wonderful," but it has its drawbacks, Lincoln said. First of all, today's supercomputers do not incorporate all the parts of yesterday's digital machines. Where older computers might need 7,500 semiconductor parts to achieve the right performance, the newer models use one-tenth of that number. Semiconductor companies do not want to devote all their time

to manufacturing 750 unique parts for vendors that will probably only sell 10 supercomputers per year, Lincoln explained.

Compounding the supercomputer demand problem is the fact that most LSI semiconductors take at least five years to develop from drawing board to finished product. In addition, industry experts say that it would take a minimum investment of \$1 million to develop the next generation LSI — also unthinkable when you consider the small marketplace for large computers, he said.

Limitations on supercomputer memory are another problem, Lincoln said. Memory usually accounts for two-thirds the cost of the average supercomputer and has a bigger effect on overall system performance than any part of the computer. However, most computers incorporate

(Continued on Page 58)

Relational DBMS Out for VAX-11

LOS GATOS, Calif. — Britton-Lee, Inc. has unveiled relational data base management systems (DBMS) based on its Intelligent Database Machine (IDM) for Digital Equipment Corp.'s VAX-11/750 and -11/780 running under VMS.

In addition, versions of the System 300 and System 600 DBMS are available for use with the DEC PDP-11 and VAX-11 running under Bell Laboratories, Inc.'s Unix operating system, the vendor said.

The DBMS software is said to be based on Britton Lee's IDM, which combines relational data base management software with hardware designed to perform at high speeds by off-loading the data base management function from the computer.

The Systems 300 and 600 include an IDM mounted in a 40-in. cabinet, which was designed to interface directly to the DEC VAX Unibus adapter and support software that runs under the MVS operating system.

The 300 and 600 reportedly can be connected to several computers simultaneously to enable multiple VAX computers to use it as a centralized data base resource. The optional System 300/600 Interface Package provides this feature.

The System 300 is said to be suited for medium-demand VAX applications; the System 600 is a higher performance prod-

uct intended for applications with large data bases and many users. The System 300 reportedly can control up to four Storage Module Drive compatible disk drives for data bases of up to 2.7G bytes.

The systems attach to the VAX computer via a high-speed parallel interface, the vendor said.

Included with the System 300 or 600 is Britton-Lee's Intelligent Database Language (IDL) query language and a runtime subroutine library designed to allow VAX-11 Fortran and Cobol programs and Bell Labs C programs to access System 300/600 data bases. Optional VMS precompilers will enable IDL commands to be embedded in VAX-11 Fortran and Cobol and C programs.

Data base administration utilities designed for backup, crash recovery and bulk loading of data are incorporated in the standard product, the vendor noted.

The Britton-Lee System 300 and System 600 can be ordered beginning June 1. The price of the System 300 starts at \$62,900 and the System 600 starts at \$85,300. The System 300/600 Interface Package is available for \$15,800. Pricing for the Unix versions of the System 300 and 600 is the same.

Britton-Lee is located at Albright Way, Los Gatos, Calif. 95030.

Disaster Recovery Handled by Center

LANSING, Mich. — Auto-Owners Insurance Co. has opened a disaster recovery center.

The facility contains raised flooring, motor generators, a fire protection system, water cooling, communications lines and a backup diesel generator. For a \$1,000/month fee, users may, in the event of a disaster, install their own computing equipment and pay a daily \$500 occupancy fee. The center can be used for up to six months, the vendor said.

The center is available for up to 15 users, the vendor said from 6101 Anacapi Blvd., Lansing, Mich. 48917.

SYSTEMS & PERIPHERALS

VM Software Inc.

VMBACKUP: Minidisk Backup & Restore

VMBACKUP will:

- Save computer resources by keeping VM available during DUMPS and RESTORES
- Save time & tapes by dumping only data that has changed yielding up to 90% savings
- Save personnel time by offering an end user restore

VMBACKUP Highlights:

- Keeps VM available continuously
- No modifications to install
- Cataloging of minidisks, files, and tapes
- Incremental backup
- End user restore option
- Support for CMS & non-CMS minidisks
- Packing, encryption, & chargeback
- Standard label tapes

VMTAPE with OS/VS Interface

VMTAPE will:

- Save tape librarian time by offering one database to maintain
- Save data from being clobbered inadvertently by offering standard label tape support
- Save operator time by transferring decisions to VMTAPE

VMTAPE Highlights:

- No modifications to install
- Interface to MVS or VS1 tape manager
- Services multiple mounts concurrently
- Supports both interactive and CMS BATCH users
- Comprehensive data security facilities
- Extensive expiration date support

Free Report for VM Installations: IBM System Software Strategy

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- ☐ Send VM BACKUP information.
☐ Send VMTAPE with OS/VS interface.
☐ Send VMTAPE information for my VM only shop.

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VM Software, Inc., P.O. Box 985 • Vienna, Va. 22180
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SLT-800 Evaluates, Cleans Tape Reels

WALTHAM, Mass. — Dennison Kybe Corp. has introduced an automatic self-loading computer tape maintenance system designed for tapes used on high-speed, high-density drives.

The microprocessor controlled SLT-800 cleans and electronically evaluates the condition of a 2,400-ft reel of tape in 3.75 min and tests the tape for proper load performance. It also includes fail-safe provisions to protect the

tape, a spokesman said.

The SLT-800 is priced from \$17,995 with delivery lead times averaging 30 to 45 days. Dennison Kybe is located at 82 Calvary St., Waltham, Mass. 02254.

Line of Quad-Density Flexible Diskettes Out

BEDFORD, Mass. — BASF Systems Corp. has introduced a line of quad-density flexible diskettes.

Bits & Pieces

The Flexydisks are reportedly individually certified to be error-free for all double-density, 96 track/in. applications. Available in all sector configurations as well as single- and double-sided models, the diskettes cost between \$4.50 to \$6.50 each, depending on the number of recording sides and quantity purchased.

BASF is located at Crosby Drive, Bedford, Mass. 01730.

Series 21 Systems Get Enhancement Tools

PARSIPPANY, N.J. — A package of expansion and system enhancement options designed to add greater speed, flexibility and expansion capabilities to Mohawk Data Sciences Corp. (MDS) Series 21 distributed data processing systems was announced here by MDS Systems Division.

The new features include capabilities for up to eight operator stations/system; system memory expanded to 512K bytes; communications protocols for asynchronous, bisynchronous or IBM 3271 synchronous data link control modes; and Isam file management.

The Series 21 system ranges in price from \$7,900 for a single station up to about \$60,000 for a fully configured system, the vendor said from Seven Century Drive, Parsippany, N.J. 07054.

Exec Foresees

Supercomputers A Step Behind

(Continued from Page 57) memory technologies that have been around more than a decade.

Logic integration also presents some difficulties for memory designers. As chips are packed with more and more capacity, more gates and pins are needed to handle the increased density. As a result, the chip size remains the same, but the ceramic surrounding the chip expands due to the increased number of pins.

As more pins are added, the distance also increases between the wire connections and the chip logic, which effects the device's speed.

Lincoln claimed that the architects on supercomputers are "all hung up on silicon and not design." As an example, he pointed out that when CDC's Cyber 706 was being tested, its initial power supplies — reportedly bought from an outside firm — melted in the machine's intense heat. The engineers had designed a superfast computer but reportedly failed to consider thoroughly the machine's cooling needs. CDC later replaced the inadequate power supplies with units that could withstand the computer's extremely high temperatures.

The CDC consultant observed that liquid and immersion cooling seems to overcome the high heat problem that results from higher system speeds. However, even cooling and the supercooling of cryogenics has its problems.

While the still experimental Josephson Junction — which uses supercooled liquid hydrogen as an immersion medium — has the benefits of fast speeds, they will be difficult to maintain.

It is nearly impossible to take the Josephson Junction out of its cold liquid bath, bring it into relatively scalding room temperatures and plunge it back into the cold without somehow damaging the device.

There is a tremendous danger of doing more harm than good, Lincoln said.

What's the difference between Dumb and smart?

\$50. The next real question is whether you need conversational or block mode operation.

Dumb is conversational. Smart is conversational/block.

Dumb has limited editing capabilities.

Smart has full editing capabilities.

Dumb doesn't have any shiftable function keys. Smart has 8.

Dumb has a gated extension port. Smart offers a printer port.

Dumb offers reverse video, reduced intensity, and combinations. Smart offers those plus blink, blank, underlining, and full screen reverse.

Smart also offers protected fields, international character sets and popular terminal emulations.

They both offer a 12" display, 24x80 white or green screen, upper and lower case, plus punctuation and control, individual cursor control keys, built-in numeric keypad, and full/half duplex up to 19.2K baud.

With all these differences,

there's one surprising similarity.

They're both available from one source. Lear Siegler.

The same Lear Siegler that virtually every industry-conducted survey shows to be the world's favorite independent terminal manufacturer.

The same Lear Siegler that's the price/performance leader all the way up and down the general purpose CRT terminal scale.

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Quantity One U.S. Prices. F.O.B. Anaheim, CA. Dumb Terminal is a registered trademark of Lear Siegler, Inc.

MINITWO LTD

Disk Controllers Run With LSI-11s

SAN DIEGO — Datasystems Corp. has introduced two software-transparent Winchester disk controllers for Digital Equipment Corp.'s LSI-11 microcomputers.

The Datasystems Model 5121 interfaces with 5¼-in. disks with the Seagate Technology standard and the Model 5122 interfaces 8-in. disks with the Shugart Associates, Inc.'s SA1000 standard.

Both models are said to support up to four drives and provide from 5M- to 40M bytes of formatted disk storage without any software development or changes to the DEC operating system. Each controller emulates a DEC RLV-11 attached to RL01/02 disk drives and uses standard DEC-supplied RLV-11 diagnostics.

Datasystems controllers reportedly feature an on-board formatter, a bootstrap loader and elaborate self-test features. The formatter does not require a floppy disk and handles all logical to physical space assignments.

The on-board Bootloader eliminates the requirement for a DEC-supplied bootstrap and automatically loads the LSI-11 memory from an attached disk, the vendor said.

The 5121 and 5122 cost \$1,955, plus cabling. Datasystems is located at 10072 Willow Creek Road, San Diego, Calif. 92131.

Prices Restructured On Low-End Micos

ELMSFORD, N.Y. — Mini-Computer Systems, Inc. has announced the restructuring of its low-end Micos 100 configuration pricing.

The Micos hardware and the Micos Office Management System are now packaged to provide a two-terminal shared logic office management system at \$19,700.

The system consists of the Micos 100 CPU with 64K bytes of MOS memory, a 10M-char. disk drive, two CRTs, a dot matrix printer, the Micos operating system and software, according to the vendor spokesman.

Mini-Computer Systems is based at 399 Fairview Park Drive, Elmsford, N.Y. 10523.

Burroughs Desktop Series Out for Small Companies

DETROIT — Burroughs Corp. has announced a series of desktop small business systems for businesses with gross revenues of less than \$25 million. The systems can run as stand-alone units, as part of a distributed data processing network or in workstation clusters.

The Burroughs B20 series features a 16-bit microprocessor with random-access memory expandable from 128K- to 640K bytes with mini disk and Winchester disk storage, Burroughs said.

According to the company, the B20 will operate under the Btos B20 operating system, which will support Basic, Cobol, Pascal and Fortran; data management facilities; and integration capabilities between word processing and DP. Industry-standard data communications protocols are also available.

Software packages include general busi-

ness applications, a financial program called Multiplan, a forms editor, a WP package and a data manager for custom software developing.

The two members of the B20 family introduced by Burroughs include the B21 and B22. The B21 is a workstation model designed for basic functions as data entry. The B22 is for users requiring mass storage and printing. The machines are priced between \$8,000 and \$20,000, depending on configuration.

Available in June, the B20 will be marketed through Burroughs' direct sales force; through four computer centers scheduled to open in New York, Chicago, Houston and Atlanta in July; and through third-party dealers and distributors. More information is available from Burroughs' World Headquarters in Detroit, Mich. 48232.

EMC Announces Memory Line: Single-Board, Prime-Compatible

NEWTON, Mass. — A line of memories ranging from 256K bytes to 1M byte, all on a single board and compatible with Prime Computer, Inc. machines, have been introduced by EMC Corp. The add-in memory is half the price of memory purchased from Prime, EMC claimed.

EMC also announced four warranty/service plans to support the line of add-in memories and a discount schedule that can reduce memory prices by as much as an additional 30%.

The add-in memory line includes the E8 memory, which provides 1M byte of mem-

ory on a single board; the E7, with a capacity of 512K bytes; and the E6 memory, with a capacity of 256K bytes. The three incorporate the 64K-byte, very large-scale integration random-access memory components.

All three EMC memories have automatic error detection and correction circuitry, and support interleaving.

The 1M-byte memory costs \$18,000, the 512K-byte board costs \$11,250, and the 256K-byte unit is priced at \$6,750, EMC said from 385 Elliot St., Newton, Mass. 02164.

Cobol-Oriented

TMC Unveils First Offering

FORT LAUDERDALE, Fla. — Technology Machine Corp. is a recently established computer manufacturer that has entered the market with the introduction of its TMC990 computer line.

The TMC990 Performance System is a 16-bit processor that starts as a small floppy and reportedly can be expanded up to 1M

bytes of memory and 384M bytes of disk storage using the same operating system. The system incorporates Texas Instruments, Inc.'s 9900 series of boards, and the operating system is Cobol-oriented.

This line ranges from \$11,500 to \$33,950. Technology Machine is at 2775-C Cypress Creek Road, Fort Lauderdale, Fla. 33309.

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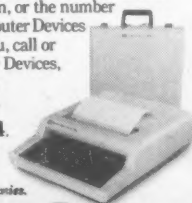
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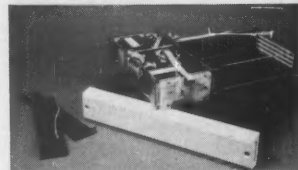
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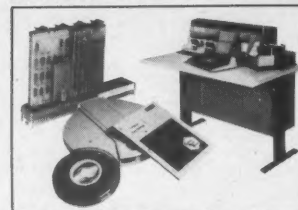
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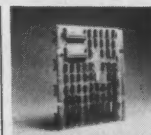
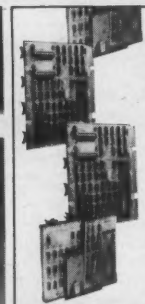
DISKS/TAPES



EXPANSION BOXES



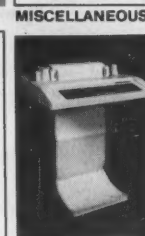
SPECIAL OPTIONS



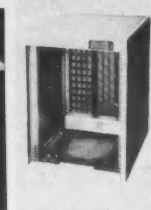
MEMORIES/COMM



VIDEO TERMINALS



PRINTERS



CABINETS

PART NUMBER	DESCRIPTION	LIST PRICE	DISCOUNT	SALE PRICE
DISKS				
RK05F-AA	19.2 MBIT DEC PACK DISK TO REPLACE RK03 120/60	\$ 5600	50%	\$ 2800
RM03-AA	SINGLE ACCESS 67 MBYTE 3600RPM CDC 9762 DISK, H9631, 120/60	20300	30%	14210
RLV11-AK	LSI11 CTL + RL01 + RL01K-DC	6400	30%	4480
RL11-AK	UNIBUS CTL + RL01 + RL01K-DC	6400	30%	4480
TAPES				
TU58-VA	TU58-VX (DUAL DRIVE), TU58-VB (I/O CABLES, MEDIA, DC PWR CABLE)	1500	50%	750
EXPANSION BOXES				
BA11-PE	6 SYSTEM EXPANDER BOX W H7420-A PS, NO CORE REG, 120Vac	4150	50%	2075
BA11-VA	H9281-BA, H7833-A, 120Vac (13.4"W, 3.6"H, 11.7"D)	700	50%	350
H334-E	H334-X W H7872-A POWER SUPPLY, 120Vac	1350	50%	675
CABINETS				
H9610-AC	11V03-L CAB 30" W/O POWER CNL	1350	50%	675
H9612-AC	11T03-L CAB 40" W/O POWER CNL	1690	50%	845
H9613-AC	40" CAB W/SOLID TOP W/O PC	1690	50%	845
MISCELLANEOUS				
FP11-EA	FLOATING POINT (23 + 9 OR 55 + 9) PROCESSOR, H7421-C, 120Vac	6400	70%	1920
KE11-E	EXPANDED INSTRUCTION SET (MULTIPLY, DIVIDE, SHIFTS), FOR 11/35, 11/40	1900	53%	900
KE11-F	FLOATING POINT INSTRUCTION SET FOR 11/35, 11/40	1900	53%	900
KY11-D	MEMORY MANAGEMENT FOR 11/35, 11/40	3350	55%	1500
KY11-LB	PROGRAMMERS CONSOLE	950	30%	665
REV11-A	EXT REFRESH + BOOT + TERM	340	50%	170
REV11-C	EXT REFRESH + BOOT 1	340	50%	170
VK8-AB	VIDEO & KEYBOARD CONTROL, 24 LINES 80 CHAR, 50Hz	1050	70%	315
COMMUNICATIONS				
DPM23-A	KDF11-AA, MSV11-DD, ISV11-B, BA11-NC, QJ642-AZ RSX-11S, QJ658-AZ, 120Vac	11500	30%	8050
DPM50-FA	INTELLIGENT I/O SUBSYSTEM: KDF11-AA, H333-A, TEV11, MSV11-DD, ISV11-A, QJ642-DZ RSX-11S, QJ655-DZ, QJ658-DZ, 120Vac	11450	30%	8015
DRV11-00	PARALLEL INTERFACE UNIT	300	15%	255
H326W	H326 EXCEPT NO COVER OR STRAIN RELEASE	275	50%	135
DRV11-J	64 LINE PARALLEL INTERFACE	450	20%	360
DLV11-F	EIA & 20mA ASYNCH SLU	370	30%	255
DH11-AA	16 ASYNCH LINE MUX DIST PANEL & 120Vac PS PROG LINE SPEEDS	8800	50%	4400
ISB11-A	INDUSTRIAL SERIAL BUS CONTROL: KMC11-A, MB202-YE 56KBAUD, 1 WIRE DAISY CHAIN TO RT800 SERIES	8455		2535
DPM50-HA	DPM50-FA EXCEPT QJ642-AZ, QJ655-AZ, QJ658-AZ, 120Vac	12640	30%	8845

PART NUMBER	DESCRIPTION	LIST PRICE	DISCOUNT	SALE PRICE
PRINTERS				
LA180-EA	LA180-PA + LA1XX-NW EIA INTERFACE, 120/60	\$ 4455	70%	\$ 1335
LA36-CE	KEYBOARD DECWTR 120/60 20mA	2970	80%	550
LA36-CJ	KEYBOARD DECWTR 240/50 20mA	2970	80%	550
LA36-DE	LA36-OK W/20mA	1835	70%	550
LA36-DK	LA36 20mA W/O CABLE 120/60	2695	80%	535
LA36-DN	LA36-DJ W NO RIBBON, PAPER, CABLE, 240/50	2695	80%	535
LA36-HE	KEYBOARD DECWTR 120/60 EIA	3080	80%	615
LA35-CE	REC ONLY DECWTR 120/60 20mA	2475	80%	495
VIDEO TERMINALS				
VT55-FA	GRAPH TERM W/COPY 120/60 20mA	5830	70%	1745
VT110-AA	DPM01-M + AVT100-AA, 120Vac USA LINE CORD	6325	50%	3160
VT62-AC	WITH EIA W CONT, 120 Vac	3350	85%	500
VT100-NB	VT100-AB W VT1XX-PN DECFORM KEYCAPS, 240Vac	2150	30%	1500
VT110-AB	DPM01-MS + VT100-AB, 240Vac USA LINE CORD (50Hz)	6325	50%	3160
VT55-FB	VT52-BB W GRAPHING CAPABILITIES, 220/240Vac 50/60Hz	5830	70%	1745
MEMORIES				
MF11-UP	32KB CORE IN DOUBLE SYSTEM UNIT, ROOM FOR ADDITIONAL 32KB. UNIBUS INTERFACE	9600	84%	1500
MF11-WP	64KB CORE IN DOUBLE SYSTEM UNIT, ROOM FOR ADDITIONAL 64KB. UNIBUS INTERFACE	10100	75%	2500
MK11-BE	128 KBYTE MOS MEM EXPANSION (2 MS11-KE)	17200	70%	4995
MM11-DP	16K 18 BIT 18 MIL PARITY MEM, ONE 1" BOARD	5750	70%	1725
MM11-UP	32KB CORE, ADD-IN FOR WF11-WP	8600	86%	1200
MM11-WP	64KB CORE, ADD-IN FOR MF11-WP	8500	76%	2000
MMB-AA	8K X 12 MEMORY, G649 + H219-A, 1.5 USEC	2875	74%	750
MMB-AB	16K X 12 MEMORY, G649 + H219-B, 1.5 USEC	3680	74%	950
MMB-EJ	8K X 12 BIT 18 MIL MEMORY, 1.5 USEC	2050	51%	1000
MRV11-AA	PROM/MROM MEMORY UNIT	190	50%	95
MRV11-BA	PROM MEMORY UNIT	350	50%	175
NS11-JP	16K MOS MEMORY 11/04-34	3450	70%	995
NSB-CB	32K 32 BIT MOS RAM, 4K CHIPS (M8417-BA)	3850	66%	1300
MSV11-DC	16K BY 16 RAM	500	30%	350
MSV11-DD	32K BY 16 RAM	500	15%	425
MS11-FP	8K 18 BIT MOS RAM (N7847-AD)	1700	85%	250
MXV11-AC	32KB RAM, 2 ASYNCH EIA SLU, SOCKET FOR 2-24 PIN 5V ROM (M8047-CA)	750	30%	525
MM11-YP	32K 18 BIT MEMORY, ONE 1" BOARD	6300	70%	1890
MS11-LB	128KB MOS MEMORY FOR 11/34A	2400	30%	1680
SPECIAL OPTIONS				
CD11-A	CR04-E 1000 CPM TBL TOP RDR (DOC M1000) + CD11 CONT, 120/60	14890	45%	8250
CD11-B	CR04-F 1000 CPM TBL TOP RDR (DOC M1000) + CD11 CONT, 240/50	14890	45%	8250
CD11-EA	CR04-K 1200 CPM CONSOLE RDR (DOC RS1200) + CD11 CONT, 120/60	26800	56%	11700
CMS11-JC	CM11 CONT + DOC TM600 MARK/HOLE SENSE CR, 600 CPM, 120/60	11300	27%	8250
CTS11-JB	CARD TERM CONT, DECISION DATA 8010 RDR/PUNCH, ASCII, 8-BIT HOLLERITH	5800	57%	2500
LP11-VN	LP05-VN & LP11 CONT 240/50	16500	52%	8000
LP11-YE	LP06-YE & LP11 CONT 120/60	26880	52%	13000
LP11-ZE	LP06-ZE & LP11 CONT 120/60	28920	52%	13000
RP04-H	UNIT SELECT SWITCH KIT	1000	70%	300

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Small Banks Get Turnkey System

SAN JOSE, Calif. — Information Management International, Inc. (IMI) here introduced a turnkey system for small community banks.

S-100 Bus, Multiuser System Bows

ANAHEIM, Calif. — Intercontinental Micro Systems, Inc. has introduced an S-100 bus computer usable as a stand-alone processor, network master, multiuser host or multiprocessor host.

The Zilog, Inc. Z80A-based Model CPZ-48000 features 64K bytes of on-board dynamic random-access memory, two synchronous or asynchronous I/O channels, two parallel I/O channels and memory management of 16M bytes of system memory, Intercontinental said.

Also included are a floppy disk controller for single- and double-density, one- and two-sided 5-in. disk drives, eight vectored priority interrupts and capacity for either 2K- or 4K-byte on-board erasable programmable read-only memory.

Digital Research, Inc. MP/M and CP/M operating systems are available, the vendor said.

The system costs \$1,095 from Intercontinental Micro Systems at Suite E, 1733 S. Douglass Road, Anaheim, Calif. 92806.

Teletek Board Functions Without Bus

SACRAMENTO, Calif. — Teletek Enterprises, Inc. has introduced its S-100-compatible Systemmaster board, said to combine the functions of a CPU, memory, floppy disk controller and I/O boards along with direct memory access capabilities and Teletek's Basic Input/Output Subsystem (Bios).

Based around Zilog, Inc.'s Z80A family and the Nippon Electric Co. 765AC controller chip, the board requires no bus to operate, according to the vendor. It can be plugged into an S-100 bus and used as a stand-alone, single- or two-user system or as the master CPU in a multiuser or multiprocessor system.

Single-user, multiuser and multiprocessor systems software are available through Teletek from Digital Research, Inc. Systemmaster is being offered to first-time users at an introductory price of \$695 from Teletek, 9767F Business Park Drive, Sacramento, Calif. 95827.

Dubbed Informplus, the system features programs to handle budgeting, profit planning, asset/liability management, personalized direct mail, fixed-asset accounting, accounts payable, full-feature word processing, customized internal data bases and stock portfolio analysis.

The system is based on the Apple Computer, Inc. Apple

II Plus with 64K bytes of random-access memory. The system also includes a full-size display screen, a full-carriage letter-quality printer, dual diskette mass storage subsystem and an auto-dial modem for data communications over ordinary telephone lines, the vendor said.

Informplus costs \$24,950 from IMI, 1101 S. Winchester, San Jose, Calif. 95128.

Marine Operators Track Ships With Turnkey System

STAMFORD, Conn. — Marine Management Systems, Inc. has introduced a turnkey computer system designed to help commercial marine operators keep track of and prepare reports on the positions and performance of their vessels.

The Voyage Reporter includes a Hewlett-Packard Co. HP 250 minicomputer, CRT terminal, a minimum 32K-byte memory and a Winchester disk drive.

The system is available in the \$50,000 range depending on features selected (\$25,000 for software, \$25,000 for hardware) from Marine Management Systems, 300 Broad St., Stamford, Conn. 06901.

Sometimes, some of the people in our company put some really unreasonable demands on me and the rest of the dp staff.

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Verbatim says Datalife disks work so well because of the special way they're made. And because of all the quality control tests they run on each and every disk.

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call (408) 737-7771 collect for your nearest Verbatim dealer.

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Dot Matrix Printer Handles
Materials Shipping Duties

NASHUA, N.H. — Dataroyal, Inc. has introduced the IPS-5000-V, a 165 char./sec intelligent dot matrix printer that prints text, pin graphics, variable-size matrix characters, 11 bar codes and labels for shipping and materials handling.

Microprocessors within the printer direct all printing and labeling functions, a Dataroyal spokesman said, and has a mean time between failure rate of 2,000 hours. It features selectable print styles, a 9 by 9 impact dot matrix, a 96-char. Ascii set and a 2K-char. buffer.

The printer ranges in price from \$2,095 to \$2,195 and is available from Dataroyal, 235 Main Dunstable Road, Nashua, N.H. 03060.

Streamer Controller Mounts
On LSI-11 Micro Q-Bus

TUSTIN, Calif. — Western Peripherals has introduced a streamer controller designed to mount directly into one quad slot in the Digital Equipment Corp. LSI-11 microcomputer Q-bus. The TC-50 allows up to 80M bytes of back-up storage to be placed on a single roll of tape while streaming at 100 in./sec, a vendor spokesman said.

It functions as a normal stop-start drive at speeds of 12.5 in. to 25 in./sec. and is said to be software compatible with the DEC operating systems and diagnostics.

The TC-50 is available for \$1,500 from Western Peripherals, 14321 Myford Road, Tustin, Calif. 92680.

IBM Personal Computer
Gets 12M-Byte Hard Disk

MOUNTAIN VIEW, Calif. — Davong Systems, Inc. has unveiled a \$2,695, 12M-byte hard disk system for the IBM Personal Computer.

The DSI-514 uses a 5¼-in. Winchester technology drive that fits inside the second floppy disk location on the Personal Computer chassis. The disk system provides 12M bytes of formatted or 14.3M bytes of unformatted storage capacity.

The system currently runs under DOS only. The \$2,695 price tag includes the drive, disk controller board, power supply, cabling and software.

Davong is located at 1061 Terra Bella Ave., Mountain View, Calif. 94043.

Apple Offers 22% Price
Cut, Stand for Monitor III

CUPERTINO, Calif. — Apple Computer, Inc. has announced a 22% price reduction for its Monitor III video display and has introduced a stand for use of the Monitor III with the Apple II personal computer.

The price of the monitor is now \$249, which reduces the total price of the Apple II and Apple III, a vendor spokesman said. The price of the stand is \$29.95.

Apple Computer is located at 20525 Mariani Ave., Cupertino, Calif. 95014.

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Driven By Low Productivity Exec Cites Causes of Workstation Demand

By Bruce Hoard
CW Staff

MIAMI — Sluggish white-collar productivity and increasing numbers of office workers are creating a demand and a market for the microprocessor-based personal computer workstation, Vector Graphics, Inc. President Lori Harp said here last week.

Basing her claim on U.S. Commerce Department statistics, Harp said office worker productivity has increased just 4% since the '60s while factory worker productivity has jumped by 80%. She also said the average office worker has \$3,000 worth of equipment at his access while the figure for factory workers is \$50,000.

One agent for change is the burgeoning office worker work force, which she said will grow by nine million between 1980 and 1985. Concurrent with that growth will be a widespread use and sharing of computer processing power — in many cases, microprocessor-based workstation processing power — according to Harp. She believes we are at the "threshold" of a time in which such workstations finally make economic sense.

"The microprocessor-based office computer is the key to unlocking the treasure chest of productivity," she stated.

Again citing Commerce Department statistics, she told her audience at the International Data Corp. 1982 Spring Executive Conference there are 4.6 million individual businesses in the U.S. with a total work force of 51 million. Of that 4.6 million total, 85% have fewer than 20 employees, a fact that makes the smaller companies no less viable candidates for personal workstations, she asserted.

However, small companies have different needs from larger ones and should implement personal workstations in a different fashion, Harp declared. For instance, a

small company would not be well advised to set up a system of dedicated shared logic personal workstations. Instead, it would be better served by bringing it individual stations that can be used as building blocks for modular additions, such as local-area networks, she said, adding, "Don't buy obsolescence."

Most office workers are found in companies with 50 or more employees, and in those companies personal workstations can serve as "an absolutely crucial management tool," Harp claimed. Clerical workers can use the devices to realize 30% to 45% productivity gains, while professionals can gain 10% to 25%, she said. In addition, the president said the payback time for personal workstations may be very brief.

Harp described a typical desktop personal workstation as consisting of a detachable keyboard, 12-in. CRT screen, a minimum of 64K bytes of internal memory, 1M byte of disk storage (expandable) and a letter-quality printer. The system should support asynchronous and binary syn-

chronous communications terminal emulation. Such a system is available now for less than \$7,500, she claimed.

Personal workstations can assume tasks formerly delegated to mainframes that could not perform them in time to be cost effective, Harp observed. The desktop devices can be shared by several office workers and perform such tasks as word processing, electronic mail, correspondence, storage, financial modeling, budget report preparation and electronic calendar preparation.

A shared system need not be used full time in order to justify its purchase, she said. One job alone, such as the creation of an annual budget, may justify the purchase.

The increasing availability of inexpensive business software packages for microcomputers over the past year has also made them more attractive. As an example, she pointed out that a financial modeling package that used to cost "thousands" of dollars may now be obtained for between \$150 and \$200.

WP Package Runs on HP 1000, Boasts Multiple Station Feature

AURORA, Colo. — A word processing package designed to run on Hewlett-Packard Co. HP 1000 computers is available from System Services, Inc.

With Wpit/1000, the user is reportedly not burdened with memorizing several long command/keystroke sequences, but is presented a set of labeled terminal softkeys, each of which performs an entire command with a single terminal keystroke.

Other features include multiple station capability, tabbing, indenting, centering, automatic hyphenation, automatic pagination (with page numbering, heading and footing) and search with or without replacement.

The user may specify that a sequence of words must appear on the same line or page. Wpit/1000 maintains a complete document dictionary structure including optional password protection so the user is not limited by the HP file management package.

The single license price for the package is \$5,000, System Services said from Suite 301, 1630 Chambers, Aurora, Colo. 80011.

Olivetti Introduces Enhanced Versions Of Two Printers

TARRYTOWN, N.Y. — Olivetti Corp. has introduced enhanced versions of its RS-232C-compatible dot matrix and daisy-wheel printers.

The DM 5180 is said to produce correspondence-quality print at speeds up to 80 char./sec and draft-quality printing at a speed of 180 char./sec. A bidirectional printer, it uses a 16-wire dot overlap printhead with a 400 million character life and features a wide range of print fonts with four selectable character pitches, including proportional spacing.

The DY 821 is a high-speed daisywheel printer said to reproduce letter-quality printed material at a normal rate of 65 char./sec and at a peak rate of 80 char./sec. A bidirectional printer, it incorporates an RS-232C serial interface and an expandable buffer. The unit was designed for the requirements of larger data and word processing centers, according to the vendor.

Bidirectional tractor and single and double automatic sheet feeders are available as options for both printers, the vendor said.

Both printers are priced at \$3,400 in single unit quantities and at \$1,760 in quantities of 500. Both will be available for delivery in late summer.

Olivetti is located at 505 White Plains Road, Tarrytown, N.Y. 10591.

Super No Problem Beefed Up; Gets WP, DP Features

ATLANTA — Lanier Business Products, Inc. has announced the availability of CP/M, Microsoft, Inc. Basic and six advanced word processing features for its Super No Problem electronic typing system.

The CP/M includes a dynamic file manager, general-purpose editor and advanced debugger. The minimum system configuration for CP/M is the Lanier No Problem (LTE-4), LXM and DS/DT disk drives. The price of this program is \$500.

CP/M users can reportedly expand their Super No Problem's capabilities to handle programmed languages, financial planning packages, statistical packages, data management systems and professional and office aids.

The Basic software option makes it possible to add DP capabilities to the Super No Problem. With it, users can reportedly design, write, edit, run and store step-by-step programs on disks. The minimum configuration for Microsoft Basic is the Super No Problem (LTE-4) LXM and DS/DT disk drives. It costs \$500.

The six word processing features are automatic page extension, table of contents, block string move and copy, floating footnotes, operator-assisted repagination and cross-reference index. They are available in two packages costing \$1,800 and \$3,200 from Lanier at 1700 Chantilly Drive, N.E., Atlanta, Ga. 30324.

Smith Corona Enters WP Market

NEW CANAAN, Conn. — Smith Corona has entered the word processing market by unveiling a full-character daisywheel printer designed to be compatible with major small business desktop microcomputers and word processing systems.

The Model TP-I prints 140 char./sec and comes in two versions: a 10 pitch, which gives a 105-char. line, or a 12 pitch, which gives a 126-char. line. Its two standard interfaces are a Centronics Data Computer Corp. parallel interface and an RS-232C serial interface.

Other features include a low-cost daisy print wheel rather than a single-element ball or cylindrical print element, an auto-underline capacity that reportedly enables the printer to underline words or strings of characters automatically and a programmable margin system that allows the user to set and/or release margins under program control.

The TP-I costs \$895 from Smith Corona at 65 Locust Ave., New Canaan, Conn. 06840.

Features Extensive Command Language WP Software Out for DPS 6

PHOENIX — Word processing software for the Honeywell, Inc. Level 6/DPS 6 minicomputer is available from Independent Computer Systems.

WP400 is said to feature an extensive command language that provides easy operator interface and functionality. The document appears on the screen as it will on the printer, with the

addition of formatting indicators such as tabs and new paragraph markers.

Corrections and revisions are made by realignment of paragraphs and margins. Margins can be changed for the entire document. Additionally, lines are centered automatically and text may be copied from one document to another.

Standard Honeywell

VIP7200 terminals and a variety of letter-quality printers are available. WP400 requires Gcos MOD400 and 32K words for the first terminal and 64K words for each subsequent CRT terminal, the vendor said. The license fee is \$5,000/site, Independent Computer Systems said from Suite 106, 8686 N. Central Ave., Phoenix, Ariz. 85020.

Micro WP System Eliminates Memorization

BLOOMFIELD HILLS, Mich. — Business Solutions, Inc. is offering a "one-key" microcomputer word processing system said to eliminate command memorization.

Nukey uses Micropro Software International Corp.'s Wordstar word processing package and Televideo, Inc. CRT terminals. It comes with 14 replacement key caps,

step-by-step instructions for customizing Wordstar and can be installed in 15 minutes, the vendor claimed.

Nukey will retrofit Televideo's 950 terminal, TS-800 or TS-800A satellite user stations and the TS-802 or TS-802H computers running Televideo's Telesolutions.

Some of the 36 word processing functions Nukey automates include all cursor arrows, page forward or backward, find and replace, cursor forward or backward one word, set beginning and ending block markers, line insert and help.

It costs \$99.95, Business Solutions said from Suite 14, 91 W. Long Lake Road, Bloomfield Hills, Mich. 48013.

WP Package Runs Under HP-85

SILVER LAKE, N.H. — Applied Microcomputer Systems has released what is said to be a fully portable word processing package to run under Hewlett-Packard Co.'s HP-85.

Super Scribe allows for on-screen entry and modification of documents, letters, memos, reports and proposals, the vendor said.

Features include loading, saving and purging documents from tape; editing and printing current documents; appending current documents with another document from tape; and replacing phrases with current documents. All major functions are selected from a single menu, the vendor said.

The enlarged HP-85 keyboard gives single-key access to a variety of editing functions such as cursor positioning, insertion and deletion, block movement, phase searching and underlining, the vendor said. All editing changes are made immediately to both the display and the document and keyboard buffering allows text to be entered at full speed.

Super Scribe is available now at an introductory price of \$595 from Applied Microcomputer Systems, P.O. Box 150, Silver Lake, N.H. 03875.

A Harris computer raised the curtain on the new Anvil-4000 CAD/CAM software.

How did a software developer introduce a CAD/CAM software system that industry is calling the most complete package in town?

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Sorbus To Service Some Magnuson Users

By Marcia Blumenthal
CW Staff

SAN JOSE, Calif. — In a move to get back on an even keel, Magnuson Computer Systems Corp. is transferring some of its in-house field service engineering to Sorbus, Inc. a major third-party supplier of maintenance services.

Users in key Magnuson account areas will not be impacted by the change in the service operation, which is expected to go into effect by the end of next month. However, Magnuson installations in areas with

sparse user populations — reportedly Hartford, Conn.; Miami; and some Ohio locations, among others — will receive service from Sorbus.

Six locations and about 15% of the field service organization will be phased out during the changeover, reported Robert Stephens, a Magnuson vice-president. Prior to the service change, Magnuson's field service organization employed about 90 people.

Sorbus engineers are currently receiving training from the Magnuson field engineering

staff, Stephens said.

The changeover was announced late last month at user meetings in various locations around the country. Present at those meetings were top Magnuson brass — Charles S. Strauch, president and chief executive officer; Jerome J. Burke, senior vice-president of marketing; and Carlton Amdahl, one of the firm's founders, who has a long-term consulting contract with Magnuson. Corporate officers briefed users on the company's current financial and market positions and fu-

ture plans.

The overriding concern of users attending the meeting held in New York City was whether Magnuson is a viable company given its recent financial problems, reported Vincent Gorman, director of computer services at Brookdale Community College in Lincroft, N.J. Gorman was among the representatives of the nearly 40 Magnuson users attending that meeting.

There was little negative reaction from users at the meeting. In fact, most users expressed general satisfaction with their systems and service, Gorman said. Others attending that meeting, who asked not to be identified, corroborated Gorman's assessment of the atmosphere at the meeting.

Meanwhile, Magnuson is making a major retrenching effort as 1981 losses are expected to reach the \$20 million mark. In the last month the firm has pared its manufacturing operation to reflect the current level of orders. Five top manufacturing executives have left the firm in the last few weeks. About half of the resignations were voluntary, Stephens said.

The positions will not be
(Continued on Page 69)

Opposition From High-Tech

Battle Continues on R&D Bill

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Congressional supporters of a controversial bill to distribute more federal research and development funds to small firms have regrouped to mount a concerted effort to pass the legislation, which ironically is meeting its stiffest opposition from high-technology firm representatives.

The surprising aspect of this legislative battle is that until recently passage of the bill had seemed a sure bet. Unanimously passed by the Senate last December, the House version of the Small Business Innovation Act was approved by the House Small Business Committee 40 to 0.

The bill would require 12 agencies with large R&D budgets to set aside portions of those funds for small firms. Beginning at one-half of 1%, the set-aside would increase to 3% in the fourth year and continue at that level.

But now the bill, which already has White House backing, has met strong and effective

opposition from the American Electronics Association (AEA) and has been all but gutted in half a dozen House subcommittees.

The AEA, which represents hundreds of small firms, which the association claims would be the prime beneficiaries of the suddenly available R&D funds, told Congress it would rather see better federal procurement practices and less set-aside provisions muddying up government R&D regulations.

The additional bureaucracy the bill would necessitate would only perpetuate government contracting problems, the AEA said. Streamlined procurements and additional R&D tax credits for start-up firms would be more appropriate, the association told Congress in January [CW, Feb. 15].

In the intervening months, six House subcommittees have reviewed the legislation and have moved to exempt billions of
(Continued on Page 71)

Users Buying More Custom Services

By Robert Batt

CW West Coast Bureau

PALO ALTO, Calif. — Professional services companies will take an increasing proportion of end-user expenditures over the next four years, according to figures from a soon-to-be published study.

In a forecast of worldwide user spending from 1980 to 1986, Input — a management consultant and market research group here — projected that DP consulting firms would have a market share of over 30% by the end of the forecast period.

The survey forecasts that professional services, consisting mainly of DP consulting, systems design work, programming and education facilities, would grow from a value of \$7.9 billion in 1980 to \$31 billion in 1986.

The same forecast shows that spending by users on processing activities such as batch, remote computing and facilities management will jump from a 1980 level of \$16.2 billion to \$43.8 billion in 1986.

Over the same period, Input forecasts an increase in spending on system and application
(Continued on Page 66)

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IBM Names Two Fellows, Honors 40 Employees

NEW YORK — IBM awarded two of its researchers the company's highest technical honor and distributed awards totaling \$885,000 to 40 employees early this month.

Appointed IBM Fellows were Dr. Edward B. Eichelberger and Dr. Alex Mueller. These two appointments bring to 51 the total number of IBM Fellows, who can pursue technical projects of their own choice for five years.

Eichelberger was honored for his contributions to large-scale integrated circuit design and testing, for which he holds 15 U.S. patents. He works at the IBM Data Systems Division's development laboratory in Kingston, N.Y.

Mueller is noted for his experiments in solid-state physics. He was the first person to demonstrate certain phenomena are important in understanding the structural changes in crystals. He is employed at IBM's Zurich Research Laboratory in Switzerland and is a professor at the University of Zurich.

Besides the IBM Fellows, the recent awards dinner here honored employees for accomplishments such as the holographic supermarket scanner and a thermal conduction module, which provides cooling for dense circuit packaging.

Special awards went to the developers of Fortran, a language introduced by IBM 25 years ago.

End-User Budget Studied

(Continued from Page 65)

software products of almost sixfold, rising from \$4.7 billion in 1980 to \$25.8 billion in 1986.

By contrast, U.S. end-user spending on professional services is predicted to grow rapidly from \$3.8 billion to \$13 billion in the U.S., while processing will climb to \$18.1 billion compared with \$8.3 billion in 1980. Software products will top \$11.2 billion compared with \$2.7 billion in 1980.

The survey, which was broken into U.S., Japanese, European and other markets, shows that the domestic

segment will continue to be the largest in the mid-'80s. Europe is projected to remain the second largest market both in terms of overall user spending and in professional services.

"The state-of-the-art knowledge is to be found more and more within the consulting companies. They are at the forefront when it comes to implementing new developments inside a business, particularly in customized projects or in adapting existing packaged products in the shape of software," a spokesman for Input said.

The spokesman explained that the state-of-the-art knowledge on both specialist and general topics was increasingly to be found within the computer services industry.

Both the end user and the hardware manufacturers have come to realize this, he said, with hardware vendors often organizing some of their activities around consultancy services.

"Hardware manufacturers frequently expend great efforts to make sure business goes through the consultancy firms. This helps the manufacturer to make up for the shortfall of staff specializing in systems design, programming and the implementation of new systems from which many of them are suffering," he added.

Input maintained that hardware companies are relying more and more on outside groups to provide the end user with services such as systems analysis, design, programming and education. These groups span various hardware sectors.

Very few vendors, Input said, are able to offer a complete scope of services to their clients. The vast majority of hardware manufacturers have only a partial awareness of the complete systems needs of the end user.

"Professional services groups, on the other hand, involved as they frequently are in total systems implementation, have a far better visibility of end-user application needs," the spokesman argued.

The growth of these third-party outside contractors is a result of a few highly skilled people going into business on their own and attracting a coterie of specialist talent, Input said.

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	STD	No
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With Firms in Allied Fields

Bell Vice-President Hints of More Joint Ventures

By Phil Hirsch

CW Washington Bureau
NEW ORLEANS — AT&T Marketing Vice-President William Stritzler recently hinted here that the phone company is planning more joint ventures with firms in allied fields. Bell is already cooperating with Knight-Ridder Newspapers in trials of videotex technology in the Miami area and plans to do likewise with CBS in New Jersey.

Stritzler, who participated in a panel discussion at the 35th annual conference of the International Communications Association (ICA), said that if H.R. 5158 — the Communications Act rewrite bill now pending in the House — is enacted in its present form, it will prevent such joint ventures. He declined, however, to say what sorts of activities might be under consideration.

Stritzler was one of six participants in the ICA session "Deregulation and the Telecommunications Marketplace." The alleged ban on joint ventures was among criticisms he directed at the pending House bill, which is likely to be acted upon by the House Commerce Committee later this month. If approved, the legislation stands a good chance of being passed this year by the full House membership.

Key Point

The AT&T official's key point was that H.R. 5158 would, by restricting AT&T more than its competitors, reduce the opportunity of Bell customers to exploit emerging telecommunication technology.

For example, by requiring the separation of AT&T's Long Lines Division from Bell's research and manufacturing arms — Bell Laboratories, Inc. and Western Electric Co., respectively — the House bill will prevent sharing of information needed to improve the long-distance network.

Stritzler also pointed out that the bill prohibits AT&T from offering basic and enhanced services — transmission facilities and terminals, for example — as a single package, while not limiting Bell's competitors from doing likewise.

The opposing side of this argument was presented by Michael Senkowski, among others. Although H.R. 5158 isn't perfect, he said, it "recognizes that users will not have competitive alternatives to AT&T transmission services for the foreseeable future and provides regulatory safeguards until such compe-

tion emerges."

Other key benefits of H.R. 5158, Senkowski said, include the right accorded users to seek judicial review of Federal Communications Commission tariff actions and inactions, assurance that access to AT&T's basic network will continue to be available on reasonable and nondiscriminatory terms and

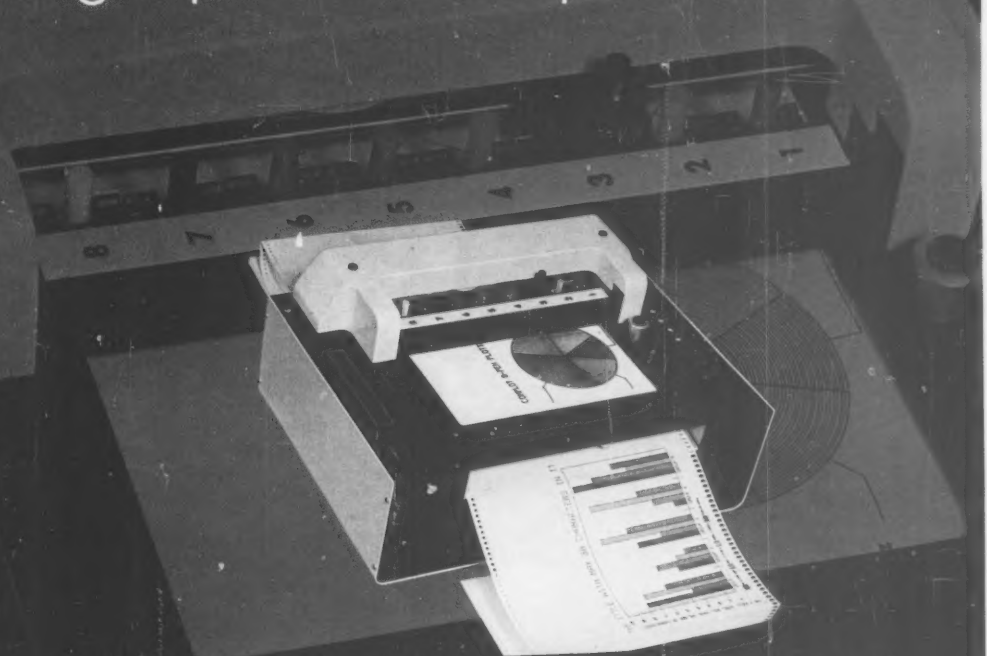
protection against use of regulated service revenues to finance AT&T's unregulated service markets.

Another session panelist was C. Gus Grant, a vice-president at Southern Pacific Communications Corp., who has been in the thick of the telecommunications policy battle on Capitol Hill for several years.

He insisted that during the past 25 years, telecommunications has changed from a monopoly to a competitive industry. Grant does not believe Congress will enact new telecommunications legislation this year, even though a bill has been passed by the Senate (S. 898), and H.R. 5158 is pending in the House.

But Grant indicated that he believes Federal District Court Judge Harold Greene, the presiding judge in the government's antitrust case against AT&T, will resolve the impasse. Greene must decide whether to accept the proposed settlement that attorneys for AT&T and the government worked out early this year.

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For complete details, contact Instruments and Systems Division, P.O. Box 15720, Austin, Texas 78761, (512) 835-0900. For rush literature requests, outside Texas call toll free 1-800-837-2820. For technical information, ask for Operator #5. In Europe, contact Instruments and Systems Division, Rochesterlaan 6, 8240 Gistel, Belgium. Phone 059/27-74-45.

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New Companies

Logical Resources, Inc. is a new firm providing computing services based on superminis with background access available as needed to larger mainframes. The firm can be reached at 244 Bear Hill Road, Waltham, Mass. 02154.

Lifestream Systems, Inc. is a new computer consulting firm that provides educational seminars, business systems

surveys, software and hardware evaluations, postpurchase services, custom services and technical classes. For information write to P.O. Box 25835, Colorado Springs, Colo. 80936.

C.H. Link & Associates is offering computer-aided design/manufacturing services for companies needing help in applications analysis, planning, team training, cor-

porate awareness and executive search. The firm can be reached through P.O. Box 13635, Arlington, Texas 76013.

The Orion Group, Inc. will be providing software and consulting services for IBM distributed processing systems, including System/34 and 38, Series 1 and related processors. The firm is headquartered at Fifth Floor, 44

Montgomery St., San Francisco, Calif. 94104.

The 11 Connexion is a firm specializing in the development of hardware peripherals for the Digital Equipment Corp. LSI-11. The firm will also provide software consulting for the DEC systems. It can be reached at P.O. Box 249, Fulton, Calif. 95439.

Kebert Corp. will develop

and market application programs for the IBM System/34 and 38. It is located at Suite 348, 5050 Quorum Drive, Dallas, Texas 75240.

Software Marketing, Inc. will specialize in assisting small software companies in planning, market research, financing, promotion, design and distribution. It is located at 55 Wheeler St., Cambridge, Mass. 02138.



Cbema Head Urges Standard Purchasing Code

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — A spokesman for major computer manufacturers recently urged Congress to establish a single procurement code for military and civilian agencies that would emphasize commercial marketplace practices, particularly multi-year contracts.

Noting estimates that private sector computer acquisi-

tions normally take two to five months, whereas major federal buys can stretch on for three to six years, Vico Henriques, president of the Computer and Business Equipment Manufacturers Association (Cbema), strongly endorsed current efforts to develop a uniform federal procurement system.

"Federal acquisition of computers and business equipment has evolved into

an ineffective patchwork that fails to acknowledge the realities of commercial practices or the needs of user agencies," Henriques told a Senate government affairs subcommittee on federal expenditures May 5.

Calling for "statutory recognition that commercial marketplace competition is essential to government practices," Henriques said government "contract terms

and conditions should follow commercial practices to the maximum extent possible.

"If the government is to achieve the very desirable goal of buying off-the-shelf commercial products by using simplified descriptions and documentation commonly found in commercial business practices, it will need to grant contracting officers more significant latitude in authority and flexibility in contracting.

"The contracting officer should be able to use normal commercial business practices for commercial products and services, including purchasing agreements, multiple-source contracts and similar contracting tools," according to Henriques.

The Cbema president urged civilian agencies be given multiyear contracting authority, as is now being developed for the Department of Defense, for both goods

and services.

Addressing an Office of Federal Procurement Policy proposal for a uniform procurement code, Henriques praised its effort to define a "practical framework for competition in the government marketplace."

But, he added, "nowhere in the draft is the notion of the government as a customer defined. Lack of such a definition in the past has led to fundamental disagreements between the government and industry over basic business issues."

Cbema, he said, suggests "the statute explicitly defines the government users, not as a single entity, but rather as many customers in many marketplaces with a variety of technical, business and educational requirements." That definition is needed, he said, "to establish an equitable buyer/seller relationship at the start of the acquisition process."

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Magnuson Changes Service

(Continued from Page 65)

filled for the time being as part of the cost containment program, he added.

The production staff currently numbers about 50 employees, a third of what it was before Magnuson began running into financial problems in the second quarter of last year.

The most recent manufacturing cuts were made because order rates failed to materialize as projected following the firm's announcement that it had obtained \$5.2 million in new financing by private investors earlier this year, Stephens said. The current factory employment level is geared for producing at least 10 systems a month, Stephens said.

Although Stephens declined to give the specific number of orders that the firm was receiving, he did say it was at about 25% of the level of a year ago, when Magnuson executives claimed the firm was shipping about 50 systems. This level would place the firm's

production at about 12 systems a month, but observers contend the level is not that high at present. The firm has about 450 units installed.

While the manufacturing operation has been drastically reduced, the marketing activities of the firm are continuing nearly intact. The firm did close six sales offices in the past two months, in line with the low volume geographic areas now to be serviced by Sorbus.

No further curtailment of sales effort is anticipated, according to Stephens. Rather, he said, the company is on an aggressive marketing tack and prospects look hopeful.

Stephens said that the firm is being run under the strictest financial controls. Many expenditures are reviewed personally by Strauch.

The company has renegotiated its line of credit with lenders. Most suppliers are on a cash payment basis, and suppliers whose bills have yet to be paid are being very cooperative, Stephens maintained.

Contracts & Pacts

Fingermatrix, Inc. has received a letter-of-intent from the First Interstate Bank of California to pursue joint-venture development of terminal fingerprint verification devices. The letter provides First Interstate Bank with purchase rights to the first 200 units, with a total value of approximately \$1 million.

Cynthia Peripheral Corp. and Modula Research Insti-

tute have signed an OEM agreement valued at \$1 million for the delivery of Cynthia disk drives and cartridges.

CPT Corp. of Minneapolis has signed an agreement with Comshare, Inc.'s Comshare Target Software to market Target's microcomputer software products exclusively on CPT's computers.

Executive Corner

- Vince Baggetta has been appointed senior vice-president of operations; Ed Raether, vice-president of sales; John Sampson, vice-president of engineering and advanced manufacturing; and Jack Tuite, vice-president of marketing for Boschert, Inc.
- David A. Barrett III has been appointed vice-chairman in charge of sales and distribution for Quadrisec, Inc.
- Robert A. Simmons has been named vice-president and general manager of the Delivery Systems Product Department of General Electric Information Services Co., a subsidiary of General Electric Co.
- Ray E. Miller has been appointed

DP Executives Form Direct Marketing Association

NEW YORK — The Direct Marketing Computer Association has been created by DP executives and consultants in the direct marketing field.

Membership in the association is targeted at executives of in-house computer operations and outside DP services catering to direct marketers such as book and record

clubs, subscription solicitation, fund raising, catalog sales and general product marketing, according to a spokesman.

The purpose of the group is to represent industry interests to government regulators at various levels, keep members informed of postal regulations and programs, disseminate information on sys-

tems and equipment and interface with letter shops and mail facilities.

The association will meet May 25 in New York City; nonmembers can attend. Yearly dues are \$495.

Further information on the association is available from Len Schenker at 750 Zeckendorf Blvd., Garden City, N.Y. 11530.

vice-president of manufacturing at Molecular Computer.

• Norman Chanoski has been named vice-president of product assurance at Precision Monolithics, Inc.

• Frank J. Sammann has joined Dataquest, Inc. as vice-president of sales for the Technology Information

Division.

• Robert A. Fuiere has been appointed vice-president of marketing and sales of Lear Siegler, Inc.'s Data Products Division.

• James L. Repsher has been promoted to the newly created position of vice-president, North American sales, at Lexidata Corp.

• Danny E. Cornett has joined Vitallink Communications Corp. as assistant vice-president of sales, southern region.


• James Lawson has been appointed vice-president of marketing and sales for Evotek.

• John R. Sidlo has been named vice-president of research and development at Henco, Inc.

• Sam Thompson has been appointed vice-president and general manager of Data Electronics, Inc.'s new Media Division.

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Then our NCC Show Issue comes out June 7th, the day of the show. It will have last-minute show information, speech previews and other show details. Pick up a copy at the *Computerworld* booth. Black and white ad close is May 27th*. Color close is May 21st.

Finally, our June 14th NCC Wrap-Up Issue will have complete coverage of all that happened, prepared by our 35-person editorial staff. You'll read who said what, who introduced what and how it works, and review the show's features and highlights in words and pictures. Black and white ad close is June 4th. Color close is May 28th.

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Nickels & Dimes

Compucorp plans to file a registration statement during its second quarter with the Securities and Exchange Commission covering a proposed offering of 800,000 shares, of which approximately 600,000 shares will be offered by the company.

\$\$\$

Intel Corp. has signed an agreement with Computer Memories, Inc. (CMI) to purchase approximately 20% of the firm's common stock for \$4.8 million. Proceeds to CMI will total \$3.6 million, the remainder going to certain major CMI shareholders. Intel will also be granted an option to purchase the remainder of the stock held by these shareholders after a two-year period at the average market price. This purchase would make Intel the majority stockholder of the company. Under a separate agreement, Intel will purchase 5 1/2-in. Winchester disk drives from CMI. In return, CMI has given Intel the option to become a licensed manufacturer of CMI disk drives.

\$\$\$

In its tender offer for DSI Corp., Anacomp, Inc. has agreed to increase its offer for all shares of DSI common stock from \$5.00 to \$6.25 per share net to the seller in cash and DSI's board of directors will recommend that its shareholders tender their shares. All directors and executive officers of DSI intend to accept the new offer. If Anacomp fails to purchase all shares tendered on or before Aug. 31, Anacomp will pay \$1 million to DSI as compensation for expenses and will not purchase any DSI stock for a period of 18 months.

\$\$\$

Sydis, Inc. has completed its first round of funding and has relocated to 4340 Stevens Creek Blvd., San Jose, Calif. Venture capital funding was provided by Merrill, Pickard, Anderson and Eyre; the Mayfield Fund; Asset Management; and New Enterprise Associates. The company will design, market and manufacture a local network of workstations with extensive communications ability.

Increased Funding Sought For Small Business R&D

(Continued from Page 65)
dollars of research funds from its provisions. Exemptions would include, among others, the R&D programs of the Defense Department, atomic energy defense programs, Health and Human Services activities, the Veterans Administration and the intelligence community.

Trying to salvage the legislation, the Small Business Committee recently held a hearing, excluding opponents of the bill and instead filling the witness table with some two-dozen staunch supporters from small business.

Frank S. Swain, chief counsel for advocacy, U.S. Small Business Administration, strongly endorsed the bill, telling the committee that small firms are 2½ times more innovative than larger companies.

Despite that, he said, of the federal R&D funds awarded in contracts and grants in fiscal 1981, small businesses received only 1% of the grant funds, 6% of the contracts exceeding \$10,000 and only 5% of the total grant and contract funds awarded.

The other 95%, he said, goes to large companies, universities and nonprofit organizations. Just 70 firms do 80% of this research, according to Swain, and approximately 60% of these funds are awarded noncompetitively. "Thus, for the most part, small business could not increase its share of these funds [without the bill] regardless of how hard it collectively worked or competed or proved itself," he maintained.

Pinpointing Control

The second prong of this attack against the bill's detractors has been charges the AEA does not actually represent companies likely to receive federal R&D monies, but rather is controlled by the large firms that would lose those alternately allocated funds.

The association has been busily defending itself from those allegations and at the time of the House hearing issued a statement saying the criticisms of the association are coming "because it's a lot easier to attack us than it is to defend a badly drafted bill on its merits."

Pat Kane, president of Applied Data Communications, Tustin, Calif., said the association's decision to fight the bill came from the AEA Small Business Services Committee, which he chairs.

That committee, he said, is comprised entirely of AEA board members who are presidents of companies

with 300 or fewer employees. That recommendation was approved by the entire board which, according to AEA, is comprised of 45 members, 24 (53%) of whom are from firms with no more than 500 employees.

Kane added that more than 80% of AEA member companies would qualify for the programs proposed in the legislation.

Petroleum Data Corp. has acquired **Cognito Corp.**, a firm providing computer and consulting services to educational institutions throughout the U.S. and Canada. Prior to the acquisition, Petroleum Data had served the petroleum market exclusively.

General Instrument Corp. has acquired **Charter Data**

Products, Inc. (CDP), a firm that designs and provides software and markets the Checkmate line of remittance processing equipment and supporting computer systems. CDP will become part of General Instrument's Data Systems Group.

AGS Computers, Inc. announced a tentative agreement to acquire all the out-

standing stock of **Atlantic Management Systems, Inc.**

ATM Network Management Corp. has signed an agreement to acquire software and other selected assets of **Boeing Computer Services Co.'s** Electronic Funds Transfer Division. Boeing Computer Services Co. is a division of the Boeing Co.

Mergers & Acquisitions

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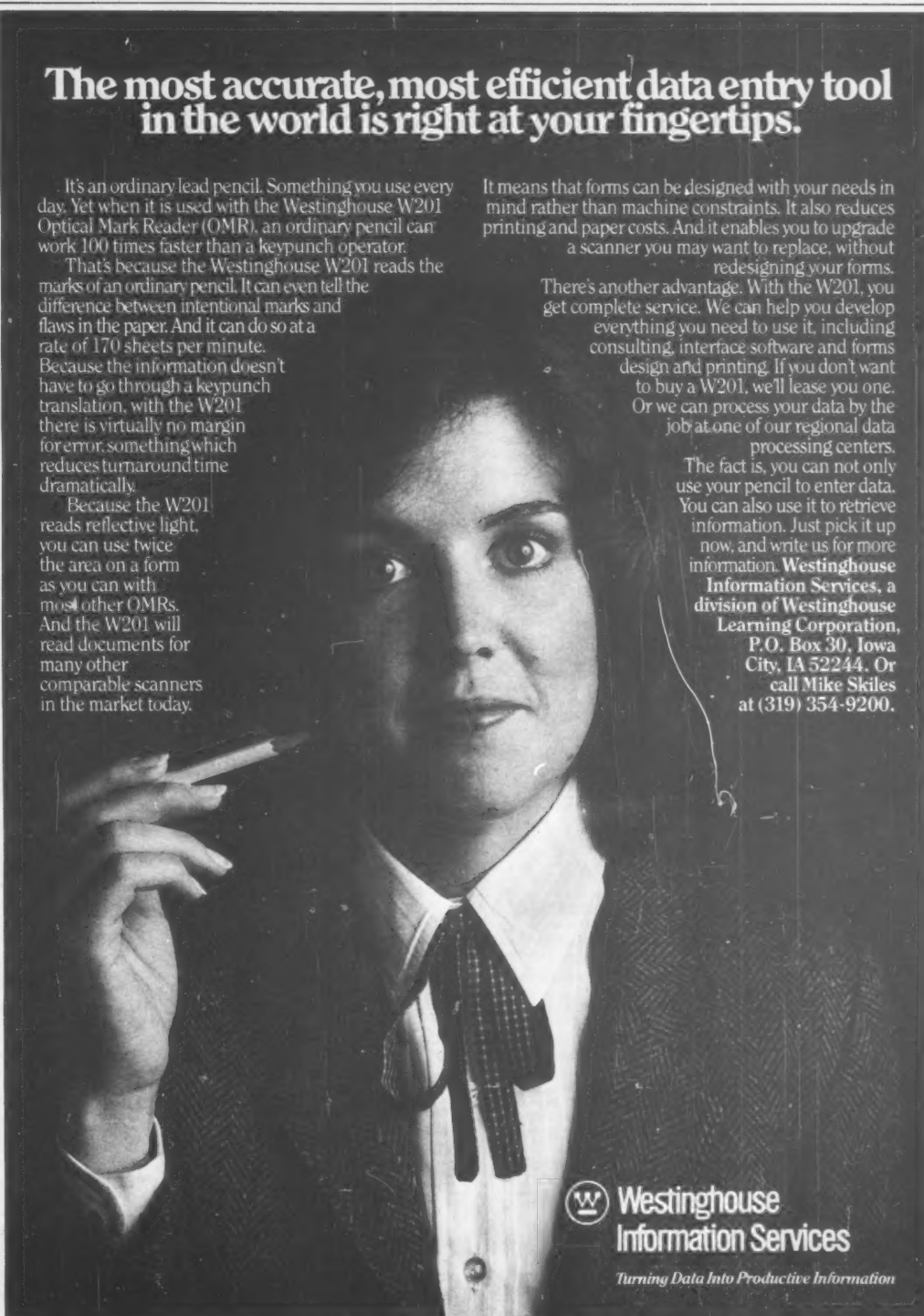
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Supershots

Intel Corp. has entered into an agreement to become Burroughs Corp.'s high-volume manufacturing source for proprietary MOS integrated circuits. Under the agreement Burroughs will design, prototype, assemble and test the proprietary circuits, and Intel will sell silicon wafers to Burroughs through its silicon factory. Intel will also provide technical information to allow Burroughs to design circuits compatible with Intel's advanced Hmos and Chos processes.

Five corporations have

joined with Purdue University, Lafayette, Ind., to create a research center to develop prototypes for a computerized factory of the future. The Computer-Integrated Design, Manufacturing and Automation Center (Cidmac) is a cooperative venture of Purdue; Cincinnati Milacron, Inc.; Cincinnati Control Data Corp.; Minneapolis; Cummins Engine Co., Inc.; Columbus; Ransburg Corp., Indianapolis; and TRW, Inc. Cleveland.

On-Line Systems, Inc. has become the Business Infor-

mation Products Division of United Telecommunications, Inc.'s newly formed United Information Services, Inc. Prior to the reorganization, On-Line was one of three companies operated by United Telecommunications' United Telecom Computer Group. United Telecommunications has also formed United Telecom Communications, Inc., to serve companies requiring the capabilities of both Uninet, Inc. and

ISA Communications, Inc.

Cullinane Database Systems, Inc. has formed a new expanded Audit Systems Division, consolidating all of its audit products and activities within a single division.

Woodbury Business Systems, Inc., a consultant in forms and records management, has formed a new division, Woodbury Computer

Services, that will specialize in developing custom computer software.

The Federal Trade Commission has completed its investigation of Tandy Corp.'s proposed acquisition of the Consumer Products Division (CPD) of Memorex Corp., clearing the way for completion of the acquisition of the domestic portion of the division, retroactive April 1. CPD International will be acquired by Tandy when consents of the governments of Canada, UK, France, Germany and Italy are obtained.

Centel Corp., Honeywell, Inc.; and Field Enterprises, Inc. have announced the formation of a joint venture to provide videotex and teletex services to the consumer market. The joint venture, Keycom Electronic Publishing, will develop, market and operate a complete videotex service called Keytran.

Orders & Installations

The National Aeronautics and Space Administration's Lewis Research Center, Cleveland, has begun negotiations with Cray Research, Inc. for the installation of a Class IV computer system. The contract, which will run for approximately 8½ years, is valued at \$21 million.

Sperry Univac has received two orders for its 1100/61 computer system. Berman, Blake Associates, Inc., a financial services company, will use the \$1.6 million system for personal check authorization and guarantee at the retail sales level and for a freight payment system. The applications for the 1100/61 ordered by Dalton, Dalton, Newport include engineering functions for the design and analysis of heating, ventilating and air conditioning projects and for structural, electrical and architectural work involved in civil engineering projects.

Comarc Design Systems has been awarded a contract by Continental Forest Industries for a turnkey geographic information system to be installed in Continental's Augusta, Ga.-based Woodlands Division in June.

IBM has been awarded a multimillion dollar contract by Knapp Communications Corp. (KCC) for primary hardware and software. Knapp will use the 4300 series system as the nucleus of a total information system serving all KCC operations.

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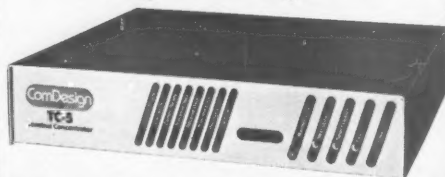
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Foreign Orders

Kennedy Co., a subsidiary of Magnetics & Electronics, Inc., has received a \$200,000 order from Le Societe Anonyme de Telecommunications, Paris, France, and a \$300,000 order from the Computer Technology Development Center, Chung Tung Hsinchu, Taiwan.

Modular Computer Systems, Inc. received a contract valued in excess of \$400,000 from Maraven S.A. Refineria Cardon, Venezuela.

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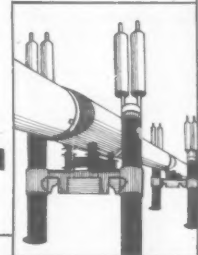
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Attention: Personnel Department

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IND-ATLANTIC AND WEST COAST Transducer Systems, Inc. a leader in electro-magnetic sensors, proximity switches, LVDT's and velocity transducers seeks two experienced sales engineers. Experience in our technology is a plus and electrical engineering background is required. Job functions entail training, supporting and directing the sales activities of our representatives together with the development of major, current and new account business. More than 75% travel is involved. These positions are factory based. We offer a competitive salary, excellent benefits, including dental coverage and a liberal expense account. Qualified candidates should forward their resumes to Jack C. Evans, Director of Marketing, Transducer Systems, Inc., 710 Davisville Rd., Willow Grove, PA 19090.

Your application will be treated in the strictest confidence. Direct applicants only.

COMPUTER SCIENCE

Faculty position available August 1982, to teach FORTRAN, COBOL, RPG, BASIC and other related courses OR to teach courses in Computer Operations. Baccalaureate Degree required, preferably in Computer Science or Business; OR in lieu of a Baccalaureate an Associate Degree in Computer Science or Data Processing with experience equivalent to a Baccalaureate. Send letter of application and resume to: Office of Personnel Services, The Williamsport Area Community College, 1005 West Third Street, Williamsport, PA 17701

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ELECTRONICS ENGINEER

The duties of this job are to maintain state-of-the-art computing equipment, including a network of Apollo computers, to manage an inventory of spare parts for these machines, and to assist in the development of hardware and software necessary for the performance of the department's research and teaching. The applicant should have demonstrated competence in the maintenance of digital electronic equipment. An Sc.B. in Electrical Engineering in Computer Science is preferred. Two years of software experience is desirable, though not necessary. Salary depending on experience.

Brown University
Providence, RI 02912

SENIOR SYSTEMS ANALYST

Systems analysis in state courts, operational analysis, feasibility, requirements, cost-benefit; systems organization, planning, procurement, specifications. Supervision of junior staff, implement automated systems. Travel in U.S. to 1/3 time. Develop projects, grant applications. Bachelor's deg. 7 yrs exp advanced systems, oral & written skills. Advanced degree computer science, exp in judicial or criminal justice desirable. Salary \$35,549 plus, depending upon exp & qualifications. Resume by June 1 to National Center for State Courts, SR SYS, 300 Newport Ave., Williamsburg, VA 23105. EEO/MF

ACADEMIC SYSTEMS ANALYST/PROGRAMMER

Work in an attractive college environment in beautiful New Hampshire on an IBM 4341. Applicants must have 3-4 years experience with systems software, applications programming (FORTRAN, BASIC and COBOL) in an educational environment. Experience with computer simulations, statistics and computer games preferable. Bachelor's degree required, MS or MBA preferred. Send resume to: Frank Barnes, Director of Computer Center, New Hampshire College, 2500 North River Road, Manchester, NH 03104.

EEO/AA

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Potentially lucrative and exciting consulting opportunity with our Florida based executive search/management consulting firm. Will not interfere or conflict in any way with your employer or day to day duties. Contact Ken Levinson or John Wichert at (305) 757-6300.

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Two (2) tenure track positions available fall of 1982 in an expanding undergraduate mathematics/computer science department. Experience in business data processing applications, COBOL, data base management, computer security or computer graphics required. Available hardware includes two CDC CYBER 172 mainframes, a Wang VS-40, a DEC POP-11/70 and assorted minis. Evidence of excellence in teaching desirable. A salary and rank dependent on experience and qualifications. Send resume, three letters of reference and transcripts to Personnel Office, Westfield State College, Westfield, MA 01085.

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Portland, Maine 04101
(207) 773-4749

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National manufacturer headquarters in Tampa Bay Florida area requires a manager of operations and systems development for our system 34. This person would function as a project leader for all systems development and assume day to day responsibilities for data processing operations. Requirements: Accounting or Computer Science degree, 2-3 years data processing experience, practical manufacturing and financial systems design experience. System 34 with MAPICS experience preferred. Send resume with salary requirements to:

Freeman Teuton
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APPLIED DATA RESEARCH, the world's oldest and largest independent systems software products company, has positions available for DP professionals in state-of-the-art product development and support at our Dallas based **DATAFORM DB/DC** product group.

Applicants must be skilled in IBM Assembly language and have a minimum of 3 years programming experience. Some data base, data communications and/or systems programming experience very desirable.

APPLIED DATA RESEARCH offers a very competitive salary commensurate with your background and potential and a comprehensive benefits package which includes semi-annual bonuses and dental, prescription drug and tuition assistance plans. For more information please forward your resume including salary history, in strict confidence to: Personnel Director.

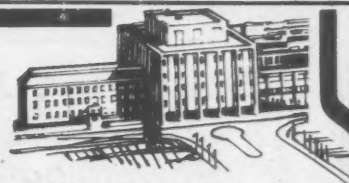


APPLIED DATA RESEARCH, INC.
8515 Greenville Avenue
Dallas, Texas 75243

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ADR

IMS DATA BASE ADMINISTRATOR LEAD IMS PROGRAMMERS SENIOR IMS PROGRAMMERS



Hobart Corporation, a leader in the manufacturing of commercial food equipment and KitchenAid appliances, with World Headquarters 12 miles north of Dayton, Ohio, is seeking qualified individuals to become members of our Data Processing Systems Development Department.

Our 1982 Work Plan calls for the analysis, development and implementation of 5 major projects identified by Hobart's five-year long range system plan. We utilize business systems planning, structured analysis and design methodologies, data modeling, data resource planning and data dictionary during a systems development life cycle. Systems and programming development is done in an IMS DB/DC COBOL and ADF.

The successful candidate for the DATA BASE ADMINISTRATOR position will have a BS degree, 5-10 years data processing experience, 4-7 years IMS DB/DC DBA experience and be able to perform as a business data administrator, as well as a data processing, data base administrator. Experience with structured techniques, data dictionary, TSO/SPF, data modeling, data resource planning and data design desirable.

The successful candidates for the PROGRAMMER positions will have a BS degree, 3-7 years data processing programming experience and 2-5 years of on-line IMS DB/DC programming experience in COBOL. Experience with structured techniques, data dictionary, ADF, BTS, TSO/SPF is desirable.

Our technical environment consists of an IBM 3033-8, MVS, IMS, DB/DC, IMS data dictionary, TSO/SPF, 250 plus terminal SNA network, VTAM, VSAM.

We offer an attractive benefit package, including relocation, hospitalization, major medical, dental, life/disability, pension and extended Christmas holidays.

If you feel you qualify for one of these positions, send your resume and salary requirements or call (513) 335-7171, Ext. 2220.



Michelle Wyen
Employment Coordinator

WORLD HEADQUARTERS TROY, OHIO 45374

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TRW a company called Sr. Systems Analyst/ Project Leader

This diversified Fortune 100 company, with a division world-wide, presently has an opening in a major division located in the Chicagoland area.

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The right individual should have 3-5 years experience as a System Analyst: 1-2 years in MRP systems and a college degree or equivalent. Individuals interested should reply with resume, including salary history to the Recruitment Supervisor.



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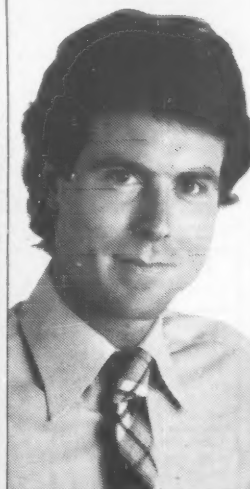
"But Etna's commitment to data processing doesn't stop there. The software is state-of-the-art, too. The training program is teaching me more than I already know. There are great benefits, including Life, Medical, Dental, and Disability Insurance. And best of all, they pay me what I'm worth."

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Due to the rapid success of our large IBM systems software security product, ACF2 (Access Control Facility) and other development projects, SKK has several outstanding opportunities immediately available for experienced systems professionals in the following areas:

TECHNICAL SERVICE AND SUPPORT

MVS system generation and maintenance experience. Good communication skills require for customer problem resolution. Exposure to industry software products desired. Familiarity with VS1 and/or VM helpful.

SYSTEMS SOFTWARE DEVELOPMENT

Programmers with strong Assembler experience and working knowledge of control blocks and internal flow of MVS, VS1 and/or VM operating systems.

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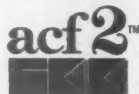
Systems analyst with two years analysis and writing experience to review customer requests and to produce software product specifications. MVS, VS1 and/or VM system experience with familiarity of OS internals. Excellent oral and written communications skills are required.

SKK, a progressive leader in an innovative field, offers qualified candidates with a strong desire to further their careers, competitive salaries and comprehensive benefits in our Chicago O'Hare location. Send resume in strict confidence to:

SKK, Inc.

Suite 530
10400 W. Higgins Road
Rosemont, IL 60018
Attn: Jean Mazur
(312) 635-1040

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SYSTEMS PROGRAMMER

Must have 4 years experience in large systems computer programming. A minimum of 1 year experience as a Systems Programmer. A knowledge of CICS/VS, ACF/VTAM and DL/I preferred.

Individual will be involved in converting our IBM 370/158 to a VM/SP system with enhanced CMS.

Qualified individual will be primary person associated with conversion of BYSNC Network to a full SNA/SDLC environment utilizing MSHF to interface to other computer systems.

Send resume of work & salary history to:

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Dean Edward Conway

East Central College

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TSO/SPF, COBOL, PL/I.

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455 or forward resume to:

ANATEC, INC.

35 W. Huron, Ste. 712

Dept. CW517

Pontiac, MI 48058

(313) 338-7430

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ATE Management and Service Company, Inc., an innovator in transportation consulting, has an opportunity for a qualified individual with more than five years software development experience. A technical degree or an advanced business degree, coupled with project management experience, is preferred. Previous transit industry experience is an advantage. Some travel is required.

Please submit your resume, with salary requirement, in strict confidence to: Lora L. Brainer, Manager of Employee Services.

ATE Management and Service Company, Inc.

617 Vine Street, Suite 800

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Reply to CW-A3245
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Framingham, MA 01701

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Our client, a leading manufacturer of computer graphics systems, has immediate openings on the East and West Coast for senior sales persons with significant experience in the computer graphics sector of the industry. Compensation and benefits in line and competitive with industry standards. To be assured consideration, submit a confidential resume with complete record of education, experience and salary history. No agencies, please.

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LYNBROW ASSOCIATES
c/o Clifford Brown
7 Brown's Ct. S.E.
Washington, D.C. 20003

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3 yrs experience or 3 years in systems analysis. BA/BSc in Computer Science. Must have knowledge of COBOL & ASSEMBLER. Design & implementation of computer systems related to insurance. Consults with managerial & programming personnel to clarify program intent. Divides up program assignments. Analyzes test runs and directs any necessary corrections, using COBOL & ASSEMBLER languages. Also reviews programs to increase efficiency & conserve storage space. \$32,916 per annum to work 35 hours/5 days/week. Please send resume to: The Home Insurance Companies, 50 Maiden Lane, New York, N.Y. 10038.

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McFadden
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Cherry Hill, NJ 08002
(609) 488-0630
(215) 388-3448

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Madison, WI 53711
(608)274-6510 Ext. 220

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South Dakota School of Mines and Technology is seeking Assistant Director for its Computer Center. Position will provide effective management assistance in areas of academic, research, and administrative computing, knowledge of computer principles, operations, programming and systems analysis is desired. A Bachelor's Degree in computer science, mathematics or related field of study with three to five years of related work experience or an acceptable equivalent combination of education and experience will be considered. Salary negotiable to \$30,000. Interested candidates should submit resumes to:

Dr. David Bell
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Programming and systems analysis in state & local courts; operational analysis, requirements, system design, general & detailed system & program specifications. Travel in U.S. to 1/3 time. Bachelor's deg. 3 yrs exp systems applications. Exp judicial or criminal justice desirable. On-line programming exp desirable. Salary \$24,050 to \$29,245 depending upon exp and qualifications. Resume by June 1 to National Center for State Courts, SEC SYS, 300 Newport Ave., Williamsburg, VA 23185.

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With a BS degree and 2-5 years experience in real time, VAX/VMS Systems, Systems Programs, Internals and VAX hardware with DEC PDP-11 computer knowledge including operation of RSX-11M Systems.

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Restructure or convert existing software systems from Prime-750 to VAX-750 or 730 machines. Programs must be tailored to meet specific customer requirements with a minimum of expense to modify the programs.

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With a BSEE/C.S., Nuclear Engineering or related Engineering Background to develop new software programs combined with Scientific Real Time, FORTRAN programming on Prime or Vax. This is APPLICATIONS ORIENTED, NOT RESEARCH!

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Our client, a premier software company recognized as a leader in computer-based decision support systems, is growing at an unprecedented rate. In the coming year, they plan to jump from \$12 million to \$24 million in sales. Right now, they're developing a new, aggressive Research and Development organization to broaden and deepen their already superior customer offerings.

Located in one of the more desirable regions of Texas, where the cost of living is exceedingly low, this company is looking for the very best people to join them. Because of the importance of attracting exceptional software talent, they're more than willing to provide the kind of compensation that's deserved.

Up to 20 positions are available for individuals at all levels — from graduates with a BS in Computer Science or Math and 2-3 years of experience, through to professionals seasoned for up to 10 years.

Specifically, they're looking for individuals with demonstrated success in the design and implementation of software applications, preferably in modeling/planning languages, on:

- Personal desk-top micro-computers, preferably individuals with experience using the IBM personal computer.
- Minicomputers, using FORTRAN and/or ASSEMBLY language. Ideal candidates would have successful experience programming on the newer 32-bit micros and other popular minis, such as Wang.
- Superminis and/or mainframe computers, using FORTRAN and/or ASSEMBLY language.
- Graphics Systems; Data Base Management Systems; Accounting Systems; Statistical Systems. Individuals in these areas need market vision, technical expertise and FORTRAN and/or ASSEMBLY language expertise. Here, you'll act as company liaison with executives in other software vendor companies. Outstanding presentation and communications skills are a must.

Time is of paramount importance. Our client would like to fill these positions within 90 days. If you're interested in a position of high visibility, flexibility and outstanding professional growth — and the opportunity to relocate to the beautiful Southwest — forward a resume or profile of your background to Alan H. Silva, President, The Adalcar Group, Ltd., Buckminster Place Ext., 561 Union Ave., Framingham, MA 01701. For immediate response call collect (617) 875-5253. Local interviews will be arranged, and on-site interviews will be held for attendees of the NCC, June 5-10. Our client is an equal opportunity employer.

The Adalcar Group provides a full range of human resources management consulting services in addition to selective search and placement activities.

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Is sought by MIT's Alumni Association to manage all aspects of output production from a large, complex DBMS. This individual will act as coordinator with MIT administrative data processing facilities and with user groups. Will also do programming in ADABAS report languages or PL1.

Candidates should have a bachelor's degree in a relevant field, along with a minimum of 3 years experience in computer operations and user support with ADABAS, CMS, VSIA, NATURAL, PL1 or comparable data base management systems.

Please submit 2 copies of resume, referencing job number A206, to:

MIT Personnel Office
E18-239
77 Massachusetts Avenue
Cambridge, MA 02139

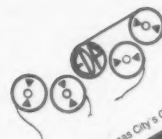
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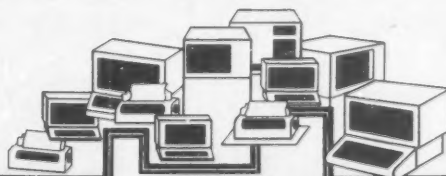
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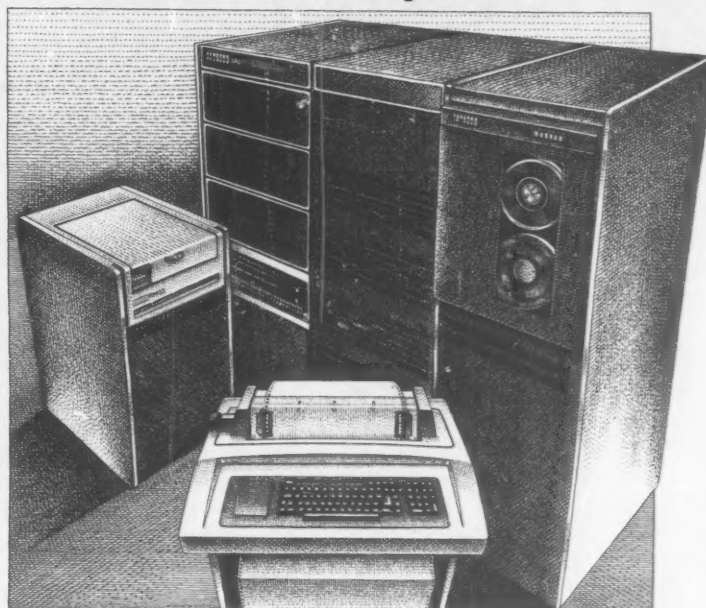
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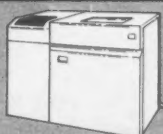
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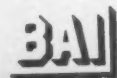
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Ad closing is every Friday,
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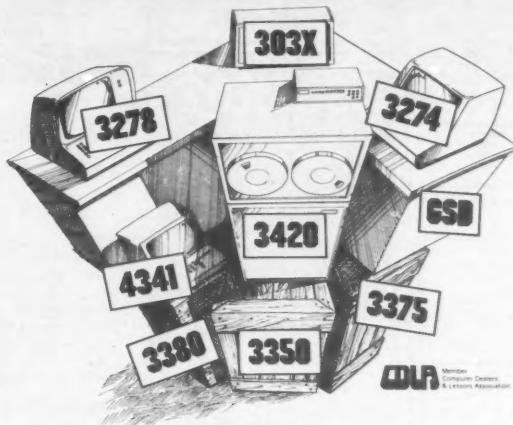
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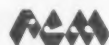
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Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

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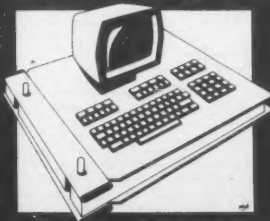
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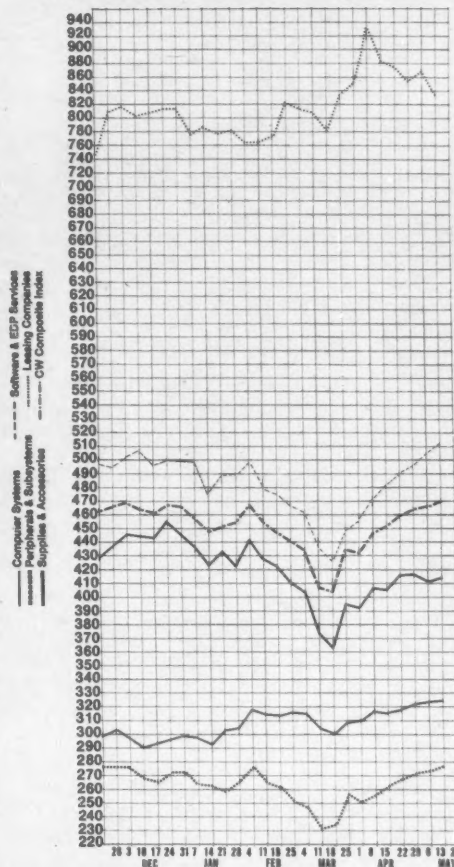
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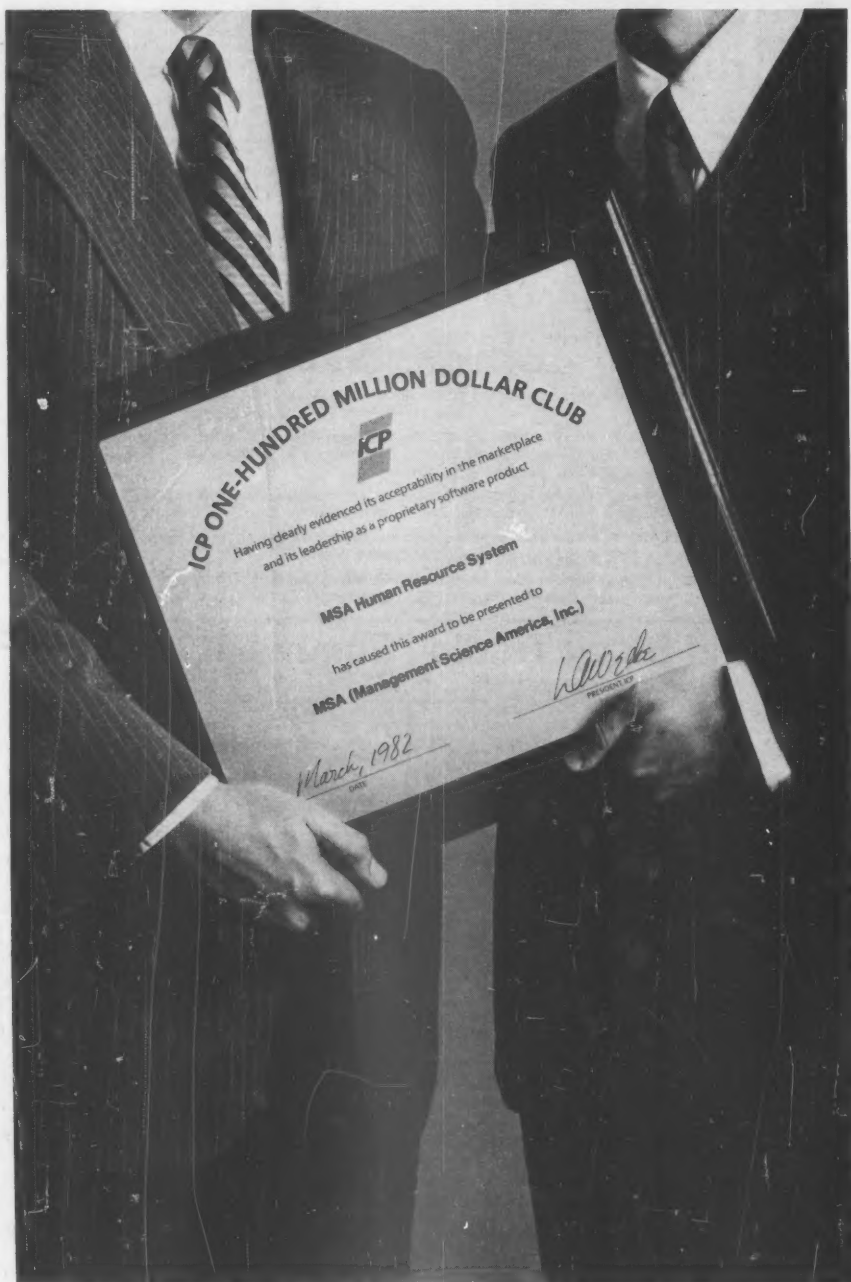
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